REPORT RESUMES

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A PLAN FOR EDUCATIONAL TELEVISION IN HAWAII.
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BASED UPON AN EARLIER RECOMMENDATION FROM THE SUPERINTENDENT OF EDUCATION FOR THE STATE OF HAWAII, A FEASIBILITY STUDY OF A STATEWIDE SYSTEM OF EDUCATIONAL TELEVISION WAS CONDUCTED. EACH OF THE THREE MEMBERS OF THE SURVEY TEAM SPENT 21 DAYS IN HAWAII DURING THE PERIOD FROM APRIL 20 TO MAY 28, 1961. CONTENT OF THE REPORT WAS DRAWN FROM THE PERSONAL EXPERIENCES OF THE SURVEY TEAM WITH EDUCATIONAL TELEVISION ON THE MAINLAND, RESEARCH STUDIES AND DOCUMENTS CITED IN THE TEXT, AS WELL AS FROM NUMEROUS PERSONS IN HAWAII WHO PROVIDED ASSISTANCE AND COUNSEL IN GATHERING THE DATA. SPECIFIC RECOMMENDATIONS INCLUDE--(1) THE CREATION OF AN EDUCATIONAL TELEVISION COUNCIL, (2) AFFILIATION OF THE STATE EDUCATIONAL TELEVISION SYSTEM WITH NATIONAL EDUCATIONAL TELEVISION NETWORK, (3) APPOINTMENT OF A COORDINATOR OF INSTRUCTIONAL TELEVISION, (4) APPOINTMENT OF A FACULTY COMMITTEE ON TELEVISION, (5) THE EQUIPPING OF ALL PUBLIC SCHOOLS WITH TELEVISION SETS, AND (6) EXPERIMENTATION WITH THE USE OF ADVANCED TEACHING AIDS. SEVERAL INTERIM ACTIVITIES ARE SUGGESTED TO PROVIDE TELEVISION PROGRAMING EXPERIENCE. (JC)

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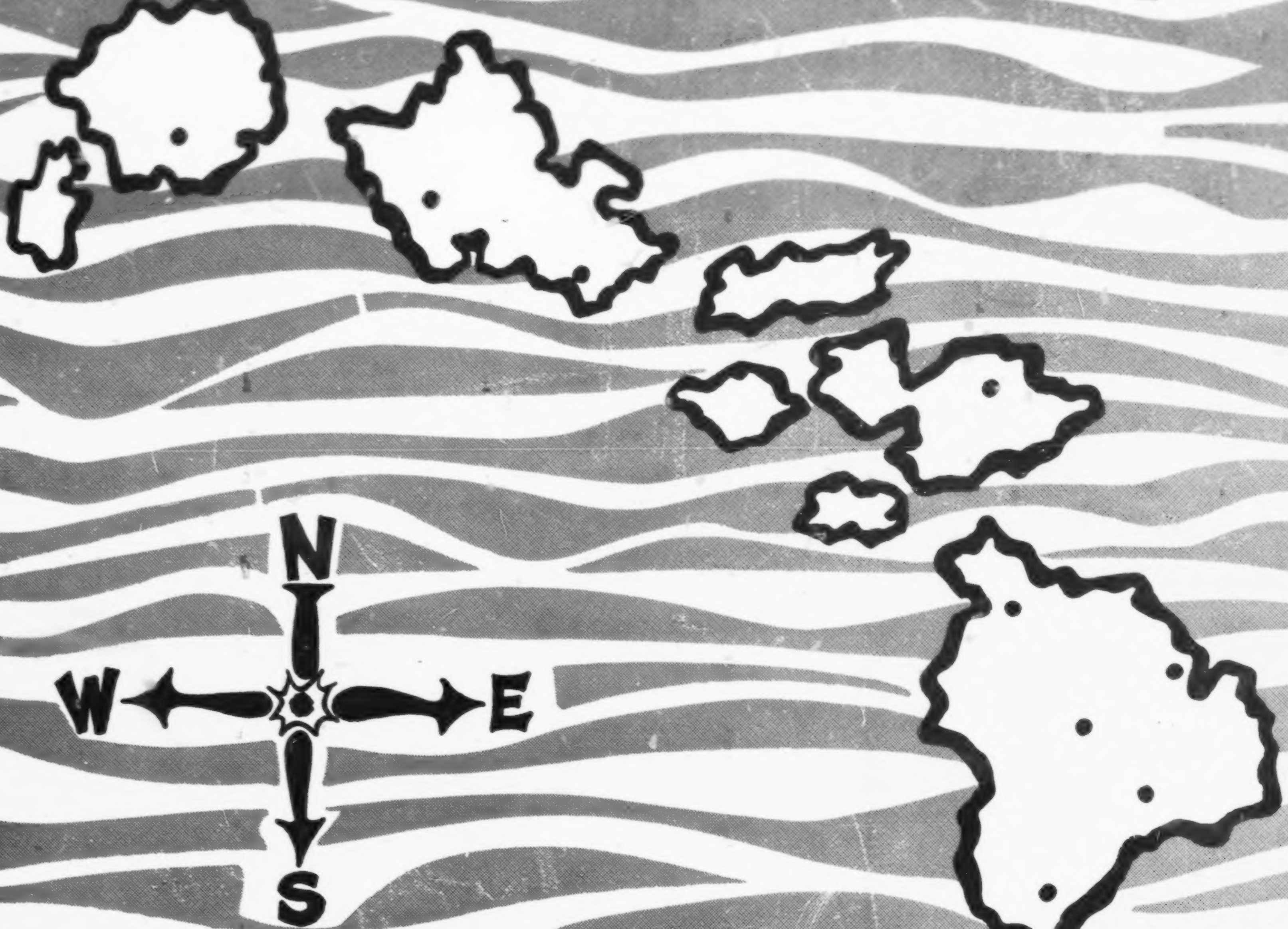

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A
PLAN FOR
EDUCATIONAL TELEVISION
IN
HAWAII

KQED
San Francisco

in cooperation with the

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
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FOREWORD

It was inevitable that Hawaii's educational leadership, constantly alert to the means of improving the quality of education in the newest state, would cast an interested eye upon education's newest and most effective teaching tool: television. This interest was heightened by an earlier survey, examining the Islands' audio-visual instructional needs, which recommended a feasibility study of a statewide system of educational television.

The present study, growing out of that recommendation, was initiated by Walton M. Gordon, Superintendent of Education for the State of Hawaii. His request to the Educational Media Branch of the U. S. Office of Education, Department of Health, Education and Welfare, resulted in a contract with KQED, the educational television station for the San Francisco Bay Area, for a survey of the needs and costs of such a statewide system.

Each of the three members of the Survey Team spent twenty-one days in Hawaii during the period from April 20 to May 28, 1961. During this brief time team members met with the Governor, members of the State Legislature, the State Board of Education, the Superintendent of Education and members of his State and District staffs, the President of the University of Hawaii and members of his staff and faculty, the administrators of the independent and parochial schools and colleges, the executive directors of the Honolulu Academy of Art and the Bishop Museum, the editors of both daily newspapers, the managers and chief engineers of the three commercial television stations, representatives of parent and teacher associations, service organizations, and business and industrial leaders.

While much of the content of this report is drawn from the personal experiences of the Survey Team with educational television on the Mainland, and from research studies and documents cited in the text, we should like to acknowledge our grateful appreciation to the hundreds of persons in Hawaii who provided assistance and counsel in the gathering of data. Their cooperation, so willingly given, was essential to this study; their warm hospitality made the task remarkably pleasant and gave meaning to the pride Hawaii takes in its "Aloha spirit."

Twenty-one days in Hawaii offer countless rewards to the fortunate visitor, but they do not confer upon him a degree of expertness and omniscience requisite to the thunderous pronouncement of Truth. The authors have made every effort consistent with mortal weakness to seek out facts, and to render their best judgment upon these facts. The reader is adjured to make his own inferences and reach his own conclusions. We trust the explorations which are reported upon herewith will be of material assistance.

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August 28, 1961

I

INTRODUCTION

The State of Hawaii, barely two years old, emerging from more than fifty years of territorial status, finds itself today on the threshold of an expansion without precedent in its relatively brief history. The consequences of this expansion will have a profound effect upon the quietly vigorous life of these islands, and in no area is it likely to be felt more strongly than in the education of its young people and adults.

The prospect is a bright one: Hawaii is in the enviable position of striking out with new beginnings, benefiting from the accumulated experience of older states without the binding fetters of its own history and traditions to hold it back. Its climate, long famous for its benign treatment of tourists, is matched by a social climate that welcomes new ideas from outside. Its multiracial population, the subject of countless books, blends the strengths of a modern and ancient culture. Its youthfulness, manifested in a State Legislature made up largely of young men and women, appropriately representing a population with an average age significantly below that of other states in the Union, carries with it a determination to "show the other Forty-Nine how." On every hand the observer notes a vigor and industry that belies the long reputation of Hawaii as a peaceful torpid paradise of langorous people, gently swaying palms, and sunburned tourists.

The Survey Team was given an opportunity to observe at first-hand the effect of this social climate upon the developing plans of public education in Hawaii. A recent survey by a private management consultant firm has resulted in a reorganization of administrative functions and the realignment of teachers' salaries within the State Department of Education.

A School Self-Study Program is working toward the improvement of elementary and secondary curricula. The newly appointed Director of Audio-Visual Services is building the State's first program for the effective use of instructional aids in the public schools. With the aid of a grant from the Ford Foundation, the State Department of Education has begun to develop two "Twenty-First Century Schools," embodying the latest thinking in educational methodology including team teaching, large group instruction, use of closed circuit educational television, and newer staff utilization patterns.

This compulsion toward self-improvement is not limited to public education; independent and parochial schools, together enrolling more than twenty percent of Hawaii's school population, are at least as vigorous in their efforts to advance the frontiers of learning to meet the educational and moral challenges of an exploding population compounded by an explosion of ideas. It is not surprising, therefore, that we found among all with whom we spoke a welcoming curiosity and interest in the application of television instruction to help meet these challenges.

A rich soil for the nurture of new ideas, and the youthful vigor with which these ideas are pursued, are only two of the distinguishing characteristics of Hawaii. Her other unique features seem less to welcome the idea of educational television than to demand it.

Isolated from the Mainland by three thousand miles of water, Hawaii is set apart from the mainstream of American life. In spite of impressive achievements of modern communications--particularly jet air travel which now brings the Islands within five hours of her nearest neighbor state--this separation from the free flow of persons and ideas has influenced the character of Hawaiian life, and the quality of its education.

It is significant that eighty percent of all teachers in Hawaii's public schools are graduates of a single institution, the state's only College of Education. It is beyond the competence or responsibility of the authors to assess the merits or drawbacks of this situation, but it is clearly evident that it does place an unusual burden for the quality of the state's education upon a single institution.

If the effects of this isolation are less apparent in the city of Honolulu--where the state's population and cultural resources are concentrated--they are glaringly apparent on what Hawaiians refer to as the Neighbor Islands. Isolation from the Mainland is compounded by isolation from the capital city, a capital city which is more than the political capital; it is the industrial, cultural, and tourist capital as well. Inter-island travel is made more difficult by the expense it entails since today it is almost entirely by air. And if this were not enough, the problems of education are aggravated by the difficulties of travel within some of the islands themselves; many of the public schools are in remote and isolated locations not easily accessible to the traveler.

These problems are not confined to elementary and secondary education; they affect other levels of education as well. The state's only university at Honolulu maintains a secondary campus at Hilo on the island of Hawaii--commonly referred to as the Big Island--but the influence of the University upon the entire population of the state is sorely circumscribed by the realities of geography. This is particularly so as it relates to the University's program of General Studies for part-time students and adults. The other cultural resources of the state--the Honolulu Symphony Orchestra, the Bishop Museum, Honolulu Academy of Arts, the

East West Center, the Community Theater--all are centered in Honolulu, available to residents of the Neighbor Islands only infrequently and at considerable expense and difficulty.

The unique geography of Hawaii seems to demand a form of communication to which open water is no barrier, available to everyone, however remote from cities, roads and airways. The Survey Team believes the answer lies in a statewide system of educational television. The technical efficacy of statewide television systems has been demonstrated by the three commercial television stations in Honolulu, whose satellite transmitters on the other islands afford television reception to more than ninety percent of the state's homes.

Understandably, the overwhelming proportion of this television service is devoted to entertainment, though all three stations carry a fair share of the public affairs and educational programs of the major American networks with which they are affiliated, and have on occasion originated local public affairs programs in cooperation with the State Department of Education, the University of Hawaii, and other educational and cultural agencies in Honolulu. However, the very nature of commercial television, with its economic necessity to appeal to mass audiences and hence mass interests, is alien to the concept of education which requires that its "audiences" be segregated into smaller groups sharing a more particularized interest.

This does not preclude from consideration the possibility of using the transmission facilities of commercial television for the specialized purposes of education during those hours when these facilities are otherwise idle. That consideration is treated elsewhere in this report. But the generosity of commercial television is limited by practical considerations, and the demands of the educational and cultural community are great.

The ultimate answer lies in the activation of these special television channels set aside by the Federal Communications Commission in 1952 for the specific and exclusive use of education. an adequate number of which have been reserved for the people of Hawaii. (See Appendix B). A further examination of the uses to which these channels might be put will clarify the argument.

II

THE PURPOSES OF EDUCATIONAL TELEVISION

It is axiomatic to refer to today's world of exploding knowledge and swifter communications as a shrinking world. In truth, the world remains constant; man grows. As he masters his physical environment and harnesses it to his purposes, his size relative to the world increases. And with this growth comes an almost frightening need for man to know more than he has ever known before, and to understand more fully what he knows.

In terms of education the demand to know does not cease with Commencement. As the too often forgotten meaning of the word suggests, it begins with the end of formal schooling and continues to increase as man matures. If he fails to meet the demand of uninterrupted learning, he exposes himself to a state of political paralysis born of a helplessness and futility in dealing with the increasingly complex problems of his society. In giving way to the feelings of helplessness, he abbrogates the fundamental tenet of democratic government, preparing the way for the control of his fate by an elite of "experts."

Herein lies one of the most serious threats to democracy. Man's right to know, as well as his need to know, must be matched with the means to know--and to understand. It must begin in his formative years when the mind is most receptive and continue throughout his life, available to him during the increasing hours of his leisure when the spirit is subject to one of the newer maladies of our mass culture: boredom.

Experience in recent years has indicated that hundreds of thousands of our citizens are not only willing to engage their minds during their leisure hours, they are eager to do so when the process does not engender its own brand of boredom. Education need not be dull even when it is difficult. Few processes in life are more exciting and rewarding than the unfolding process of discovery we call learning. When it is dull, it is made dull by inept and uninspired teaching and faulty communication. Skillfully communicated it can stimulate and free the minds of many who feel they are beyond the pale of education, including some who are now occupying seats in our school classrooms.

It is obvious beyond question that the providential invention of television is not the sole answer to the educational needs of our generation, perhaps not even the major one. But experience over the past ten years has proved conclusively that television's skillful and discreet application can make impressive inroads on some of the problems of education resulting from rapid growth.

In educational terms, ten years is a brief span of experience; much remains to be known about the applications of television to education. From the experience of schools, colleges and educational broadcasters, the authors have selected several uses which seem at this moment to have particular relevance to the State of Hawaii. We are aware that other applications have been demonstrated successfully, that many more will be revealed through experimentation. Our selection can only suggest the potential inherent in the medium. No priority has been assigned these selections; all are equally needed if the quality of Hawaii's education is not to suffer from the new State's expansive growth, and the needs of its citizens are to be adequately met in a world of increasing complexity.

Instructional Television

Within the broader confines of educational television there has grown up a more parochial use which has come to be known by its practitioners as Instructional Television (or ITV). This is the application of television to the formal task of instruction, usually but not necessarily broadcast to its learners in an organized classroom. It is doubtful that any other aspect of learning has been so thoroughly and intensively researched over such a brief period.

The results of this research are encouraging. (See Appendix C). In a summary of 393 controlled studies comparing television teaching with traditional methods of teaching,[1] Schramm reports 86 per cent of the cases studied resulted in as much or more learning in the television classroom. "There can no longer be any doubt," he states, "that students learn efficiently from instructional television. The fact has been demonstrated now in hundreds of schools, by thousands of students, in every part of the United States and in several other countries."

These studies have examined the teaching by television of a wide variety of subject matter. While they prove beyond question that the average student is likely to learn about as much from a television class as from an ordinary class (the constantly repeated refrain from these studies is "no significant difference"), they also point up the fact that some subjects lend themselves more effectively to television teaching. Schramm's analysis of the 393 comparative studies would seem to indicate a higher degree of success in teaching science, mathematics and social science by television, and less success with history, humanities and literature. Language skills and health and safety seem to fall between the two extremes. He concludes that those subjects which gain from great demonstrations (science) and timeliness (social science) could be expected to be more successful than those which depend upon clear verbalization (philosophy) or individual skill practice (reading, writing and spelling).

In noting these differences it is wise not to overlook the central fact that, on the whole, there is no significant difference in the two modes of teaching. The newer method precludes that personal give and take between teacher and learner which is thought to be the touchstone to successful teaching. But if this is a material disadvantage, instructional television has counterbalancing advantages.

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[1] Schramm, Wilbur, What We Know About Learning from Instructional Television, Institute for Communication Research, Stanford University, 1961. This report contains an excellent bibliography of instructional television studies.

The television teacher, carefully selected for superior teaching skills, is normally given much greater time to prepare the lessons and the assistance of a team of audio-visual and communication specialists. This should result in higher quality teaching. But this advantage is not necessarily limited to the television teacher. It could apply equally to the classroom teacher except for one fact: the ratio of television teachers to students taught is great enough to permit the television teacher advantages that would be an impossible luxury in most classrooms today.

There are other advantages to be noted, and Schramm calls some of them to our attention in his analysis of the television studies:

> "Television is very good at bringing demonstrations to the classroom: it lets everyone look through a microscope at the same time, gives all medical students a good view of surgery, handles films and other changes from straight classroom presentation with a minimum of transitional difficulty. It lets a school or a college share its best teachers, rather than rationing them. It provides a change of pace, often a lift, for the classroom. It brings a sense of timeliness to classes where that helps. It concentrates attention."

Among the things which instructional television does not do is replace the teacher in the classroom. Experience has demonstrated repeatedly that success with instructional television in the elementary and junior high school grades depends upon the skill of the classroom teacher in preparing the class for the television lesson, integrating the television lesson into the classroom teaching program, and involving the students in follow-up activities. The classroom teacher--present with the students to answer their questions and to tend to their individual needs--is still the pivotal element, welcoming the television teacher into the classroom as a guest and ally. Together they form a teaching team in which their respective roles tend to be mutually supportive.

For the next decade, the State of Hawaii will face the problem of educating a rapidly growing school population without diluting the quality of its education. More schools will have to be built and more qualified teachers recruited to staff them. Even if tax monies are appropriated for construction of buildings, it will become increasingly difficult to find a sufficient number of qualified teachers without lowering standards.

The solution seems to lie in making more effective use of the limited number of qualified teachers now available and to become available in the years ahead. This is particularly true in those subject areas requiring special competencies in science, mathematics and foreign language instruction. A statewide instructional television system would make it possible for teachers possessing these specialized skills to reach not hundreds, but thousands of students located on each one of the seven major islands of the state.

The process, now under way, of improving the curriculum within the State Department of Education can be accelerated enormously to keep pace with the increasing demand for a higher quality of education for Hawaii's children. The present inequalities between those schools blessed with a competent teacher in foreign language instruction, or science, or the newer concepts of mathematics, and those schools that must wait the time when more teacher are trained, can be balanced by making the best teachers available to all schools, however small in size or remote from the concentrations of teaching talent they may be.

The public schools in Hawaii are faced with another problem peculiar to these islands, with their unique history, Polynesian and Oriental cultures, and natural environment. The standard textbooks printed on the Mainland make only passing reference to those elements of culture and nature which are daily experiences to Hawaii's children. Some of these texts are augmented with local texts. But the need exists to make more effective use in the schools of those resources of Hawaiiana contained in the excellent Bishop Museum and the Honolulu Academy of Arts.

The State Department of Education has recognized this by placing a liaison person on the staff of the museum, and arranging tours of the museum for some of its students. A statewide system of educational television could make these valuable and unique resources available to all, creating a deeper understanding and appreciation of the forces which make Hawaii what it is, and assuring a continued interest in the unique culture which is their heritage.

With the instrument of a statewide educational television system, drawing the separate classrooms of the islands together into one single classroom when it is advantageous to do so, the factor of isolation of the Neighbor Islands from the cultural center of Honolulu would begin to diminish in importance. Important guests visiting Honolulu could be seen and heard in every classroom, as Robert Frost was some years ago when he visited Pittsburgh and read his own poetry to thousands of school children over the facilities of the Pittsburgh educational television station. The Iolani Palace, little more than a picture in a newspaper to many Hawaiian school children, could become a living reality as the television cameras explored, with an intimacy of detail not available to the casual visitor, the processes of an emergent state government.

Early this year the State Department of Education employed its first statewide Director of Audio-Visual Services, charging him with the responsibility of building the state's resources of audio-visual and instructional aids and their distribution to classrooms throughout the islands to increase the effectiveness of the teaching in these classrooms. Even under favorable circumstances, it will be many years before an adequate library of these aids can be purchased in sufficient quantity to provide equal opportunity to all classrooms.

A statewide system of educational television would provide the means to make these limited resources available to all classrooms without the expense of multiple prints and copies, costly distribution systems, and increasing outlays for projectors and other audio-visual devices. The authors believe that the distributive process of the future for many audio-visual materials lies in some system of television. Hawaii has the opportunity to pioneer this development. Unlike most states, education in Hawaii is under a single state system, with one superintendent, one Board of Education, and a curriculum common to all schools. This makes simple the normally difficult task of coordinating the use of instructional materials to school teaching programs, and supports the viability of a system of distribution through television.

Education in Hawaii, as elsewhere, is beset by a time lag between the discovery of new knowledge and the teaching of that knowledge to eager young minds. A conservative estimate sets this time lag at something approaching five years. Teachers must be trained and textbooks must be written. One day soon the first man will set foot upon the moon. Students cannot wait five years to know the answers to their questions.

Statewide television can provide those answers the very day this momentous event occurs; answers that go beyond a mere description of the event, but probe scientifically into the "hows" and "whys". As science continues to push back the frontiers of man's knowledge with almost frightening speed, the necessity of reducing the lag time between discovery and teaching grows more urgent. Thousands of junior high school students in the San Francisco Bay Area are today being taught the chemical, physical and mathematical principles underlying our Age of Space through instructional television.

Educational administrators, legislators and the public are increasingly conscious of the economic burden imposed upon a state in meeting the needs for an improved system of education to serve a constantly expanding population. Many of them hope to find in instructional television the economies to lessen this burden. It is possible economies in education can be effected by television, particularly in such areas as the teaching of the homebound or hospitalized student. However, the primary virtue of instructional television lies not in its possible economies, but rather in its potential for increasing the quality of education without a proportionate increase in the costs of doing business.

While its most effective results have thus far been achieved with students at the elementary and intermediate levels, its potential for increasing the quality of secondary education in Hawaii should not be overlooked. Excellent high school courses in basic physics and in the humanities are available for use in those smaller secondary schools unable to find trained teachers in these important fields. Additional courses are becoming available each year. Through television the bright student who is eager to learn need not be handicapped by a fate that placed him in a less fortunate school.

The values of instructional television have been demonstrated as well in higher education. Hundreds of college credit courses have been broadcast, covering an enormously wide range of subjects. In Chicago it is possible for the student to complete his first two years of college at home, through a television curriculum offered by the junior colleges of the Chicago public schools system. An inter-institutional teaching project in which the best professors of four universities and colleges are being shared with each other has proven successful in the Oregon State System of Higher Education.

California, faced with a burgeoning population demanding entrance to state colleges, has begun to experiment with the televised instruction of certain large lower division classes to regularly enrolled students who remain at home or in their living quarters for this particular course. The experiment is designed to lessen the pressures upon classroom space, and make more effective use of limited faculties.

While the need for such measures in Hawaii was not evident to the Survey Team, it is quite likely that as the college student population increases, the University of Hawaii and the independent colleges may wish to explore further the experiences of the universities and colleges on the Mainland, and to avail themselves of an instructional television system that reaches beyond the boundaries of their respective campuses.

In-Service Education of Teachers

The authors feel strongly that if Hawaii is to enjoy the fruits of an improved system of public education, no area is of more immediate importance, nor offers a greater opportunity to statewide television, than the in-service training of her teachers. The State Department of Education is fully aware of this need, but it is limited by time, money and geography in what it can achieve. Nearly one in every four teachers in the Hawaiian public schools holds a Provisional Certificate.[2] Out of a total of 5,638 teachers employed in the public schools, less than 800 have had a course in the use of audio-visual aids at the University.[3] The further and continued training of these teachers on the job is absolutely essential if the Department's plans for an improved curriculum are to be realized.

A statewide system of educational television can provide an effective instrument for in-service education of teachers. On the assumption that most teachers now have television receivers in their homes, this training need not await the day when Hawaii's schools are equipped with receiving sets.

The Survey Team was pleased to discover that plans are being made to use the facilities of commercial television to broadcast an excellent teacher education course in audio-visual aids recorded on kinescope at the University of Wisconsin. The course will be presented in the spring of 1962 in conjunction with the University of Hawaii's College of Education.

Additional in-service education courses are available on kinescope and videotape recordings, including NBC's series of "Continental Classroom" in physics, chemistry, mathematics and American government. These have not been seen on commercial television in the Islands, and could be programmed at an hour appropriate for teachers. Their broadcast on a statewide educational television system would have the added advantage of educational television's flexibility in offering the same course at more than one selection of hours for those teachers who cannot view it regularly at a given hour.

We believe that televised in-service education should be carefully correlated with the College of Education of the University, and where it is possible to do so, college credit or credit toward advancement be given teachers who satisfactorily complete the course. Experience has demonstrated the wisdom of providing an incentive to encourage the teacher to voluntarily view the televised course since this viewing will oftentimes occur on the teacher's off duty time.

Hawaii's plans for the introduction of new and effective methodology in the teaching of such subjects as mathematics, foreign language instruction, programs for the gifted students, language arts and sciences, will require the further training of more teachers in this new methodology. This training should originate with the State Department in Honolulu and be made available to the widest possible number of teachers throughout the Islands. Such teacher training can be effectively achieved by statewide educational television, but it must await the time the State Office is prepared with personnel and facilities to produce high quality television presentations.

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[2] Annual Report, State Department of Public Instruction, Hawaii, 1959-60.

[3] Audio-Visual Education in Hawaii, Report of Survey, U. S. Office of Education, 1960.

The Survey Team was impressed with the high quality of curriculum supervision provided in the State Department of Education. It was apparent, however, that this supervision is made less effective by the unique geography of the state. Travel between the islands, within the islands, and the cost of rental cars and hotels, makes frequent visits to District offices and schools expensive in time and money.

While television cannot substitute for personal visitations by these supervisors, it could provide a more frequent contact between supervisors and field staff at a time when this contact is essential to the successful pursuit of new curricular and methodological goals. Under present circumstances this supervision is thinly spread; television could heighten the effectiveness of the supervisor's special skills.

There is a further aspect of in-service education for teachers that should not be overlooked. Televised instruction for students provides a subtle but effective training for teachers. Some school systems using instructional television cite this as one of the major achievements.

It is a curious fact that teaching is one of the few professions whose practitioners rarely see each other's work. A television teacher with superior skills and preparation and the assistance of a team of experts can introduce into the classroom new teaching techniques and subject content. While the teaching is designed primarily for the student, it is also observed by the classroom teacher. The result in an impressive number of cases has been a general upgrading of the quality of classroom instruction in those subjects where the television instruction has been superior.

It is significant that television will be used this year at the University of Hawaii's College of Education for the pre-service training of teachers. The State Legislature has granted funds for the purchase and installation of a closed circuit television system in the College that will make it possible for student teachers to observe demonstration classes without being physically present in the class.

The value of the television system lies in the fact that each student will have the opportunity to observe the same teaching experience under conditions which permit the instructor to comment on that experience while it is taking place. The observation and comment are achieved without disruption to the demonstration class, thus preserving the validity of the experience being observed. The exposure of teachers to television instruction during their pre-service training will materially aid the public schools of Hawaii in the later effective use of television in the classroom.

The authors are not prepared to recommend that the methodology courses within the College of Education be further fragmentized to provide for the training of teachers in television, either to prepare them as studio teachers or to introduce them to the uses of the television receiver in the classroom.

The former can be more effectively achieved in the television studio at the time they are selected for their teaching ability and knowledge of the subject. The latter can be satisfactorily accomplished through brief teacher workshops at the District level, or through the medium of television itself, and ideally should be related to the instructional television courses being taught at that time.

Adult Education

Eighty-seven per cent of the homes in Hawaii are equipped with television receiving sets.[4] These 132, 200 homes represent an enormous potential classroom for adult education through television.

It is obvious that no substantial majority of this mass audience is equally motivated to learn, nor is interested in learning the same thing, hence the justifiable reluctance of commercial television stations to use their most valuable evening hours to serve the needs of relatively small audiences. In contrast, the purposes of educational television are specifically aimed at the needs of these many segmented audiences, which cumulatively comprise the total television audience.

Educational television achieves this objective by directing each of its evening programs to the particular interest or needs of specific segments of the mass audience. It follows that the viewer will choose educational programs to suit his own interests, as he would choose books from a library. These "segmented" audiences are small when measured by the mass "rating" systems, but they are impressively large by educational standards. A college course in

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[4] "Television Households by States and Counties as of January 1, 1961," published in Television Digest Special Supplement No. 7, June 26, 1961. The authors are convinced this percentage would be increased with the advent of educational television, encouraging the purchase of television receivers by that fraction of the "unserved audience" that prides itself on the non-ownership of receivers because of the generally low intellectual level of much that is currently broadcast on commercial television.

Shakespeare, broadcast by the educational television station in San Francisco, reached an audience of students that exceeded in size the enrollment for all Shakespeare courses in Bay Area colleges since the beginning of this century!

Adult education, in the context of this report, embraces a multiplicity of program activities, including the teaching of basic skills for useful living (i. e., literacy, citizenship training, child care, etc.), vocational skills (typing, shorthand, slide rule, business management, etc.), leisure pursuits (gardening, Japanese brush painting, chess), cultural appreciation (music, ballet, dance, art), post-graduate professional training (law, medicine, engineering, etc.) and liberal adult education, described by C. Scott Fletcher, president, Fund for Adult Education as "... those areas of knowledge which enlarge the understanding and deepen the insights of men with regard both to men themselves and men in their social relationships, and which, at their highest levels, assist them to develop the capacity successfully to deal with these abstract ideas that illuminate and allow them more wisely to control the world in which they live."[5]

Each of the above cited subjects, and many more of a similar nature, have been taught successfully on educational television somewhere in the United States.

Adult Education in Hawaii is centered in, but not confined to, the College of General Studies of the University of Hawaii and the Division of Vocational, Post-High School and Adult Education of the State Department of Education. We found both groups vitally interested in the use of television to increase the numbers who could be served by these two resources.

Many persons in Hawaii find it difficult, if not impossible, to reach adult education centers. Many more find it difficult to leave their homes during evening hours to attend classes. The benefits of adult education can be made available to these people in their homes, wherever their homes may be, through statewide television.

The Survey Team was particularly struck with the potential for television which lies in one problem peculiar to Hawaii: English language instruction and citizenship training. The State Department of Education maintains a successful training program in citizenship for immigrants into the United States who settle in Hawaii, providing them with the basic education to qualify for American citizenship. During the year 1959-60 the Department provided citizenship training to 1,449 adult aliens.[6]

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[5] "Toward the Liberally Educated Executive," The Fund for Adult Education, White Plains, New York, 1957.

[6] Annual Report 1959-60, State Department of Public Instruction, Honolulu.

Impressive as this figure is, it must be placed against the figure of more than 2,000 aliens who immigrate to Hawaii each year, proof that present methods are falling further behind the needs with each successive year. It can be safely assumed that the needs for English language instruction for the foreign born are no better served under the handicaps which are indigenous to this Island State.

But the potential for adult education through television only begins with programs drawn from the resources within Hawaii. Through National Educational Television, a network of more than sixty educational stations in America, the resources of all of America -- and the world -- can be brought into the homes of the Island State. Through affiliation with NET, a statewide system of educational television in Hawaii would make available to its viewers such distinguished academic minds as Dr. Frank C. Baxter, Dr. Mortimer Adler, Dr. Edward Teller, Max Lerner, the late Zechariah Chafee -- performances by the Boston Symphony Orchestra and the Boston Pops Orchestra, Pablo Casals, the Fine Arts String Quartet -- performances of the celebrated Comedie Francaise, the distinguished dramatic programs of the British Broadçasting Company (including the complete cycle of Shakespeare's historical plays) -- series on ragtime music, jazz, Oriental philosophy, opera, modern art. (See Appendix D for a partial list of programs available during the 1961-62 year.)

Only through educational television can the people of Hawaii have access to the exciting and significant programming that comprises what has come to be known as America's Fourth Network -- the network that provides the "alternative" service.

The Survey Team spent some time in seeking an answer to the question of whether an audience for this type or programming exists in the Islands. They were left in no doubt as to the answer.

Hawaiians had long since proved their interest in the arts by their voluntary support of a symphony orchestra, a museum, a community theater and an academy of art. An interest in continued education manifests itself in the evening activity on the University of Hawaii campus on those nights when adult education courses are being offered.

We found a few cynics who felt that Hawaii's unique multiracial character gave cause to believe that the state's interest in cultural matters was low. The authors felt the contrary was true. Her predominantly Oriental population, with the historic interest Orientals have had in cultural pursuits, would seem to argue that Hawaii's interest in culture is, if anything, above that of any other community of comparable size in America. If the assumption is a correct one, the people deserve to be better served by a television that draws more heavily upon the rich resources of both their ancient and their adopted cultures.

One final aspect of adult education through television deserves to be noted. The problems which beset Hawaii as it emerges from a half-century of territorial status into the newest member of the Union are demanding the interest and attention of every one of her citizens. Problems which were formerly resolved in Washington are now resolved in the privacy of the polling booths in the cities and in the villages of Hawaii. There is even greater need for the citizens of this new state to be informed on these problems, to be given access to the arguments of the opponents and the proponents of a given issue, to be given the opportunity to understand the facts and the consequences of alternative courses of action.

The two daily newspapers, the thirteen radio stations and the three commercial television stations are conscious of their responsibilities in this regard; each is carrying a portion of the burden of keeping the public informed. But together their resources are inadequate to the need.

Newspapers and radio, with their advantages of speed and space, are reporting events as they occur, and, in the case of the former, providing an interpretation of these events. Television, with its greater advantage of dramatizing the issue through films of the event itself, or an encounter with the principals involved, or its ability as visual documentation, is the least used of the three media because it is circumscribed by its own time demands or the high costs of programming.

The Survey Team strongly recommends that educational television in Hawaii dedicate itself to a fair and complete discussion and documentation of the vital issues which affect the State's growth and development: The State's General Plan for Economic Development[7], the conservation of Hawaii's natural resources, the State's plan for governmental reorganization, the improvement of public education, the location of the new State Capital building, etc.. If Hawaii's growth is to be orderly and successful it will place severe demands upon its channels of communication with the public; educational television should not be the least of these channels.

Children's Programming

Much has been written and said about television's effect upon children. It is less useful to argue that television is hurting the child, than to point to the obvious fact that it isn't doing him much good. The potential for engaging young minds with the stimulation and excitement of discovering something new is being wasted away in programs which are usually of no consequence, often noisy, sometimes condescending, and, at best, take the child's mind off his boredom and the tired mother's mind off the child.

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[7] Which the authors found particularly helpful in drawing up this report.

Educational television, since its inception, has devoted a portion of its program hours to providing an alternative for children, a program service that engages the child's mind, asks something of him, at the same time holding his attention through constructive entertainment.

Many of these programs are originated by the local educational television station, drawing upon talent to be found in libraries, children's theaters, science clubs, youth organizations -- and among those rare adults to whom a child is a human being.

Local programs are augmented by an excellent children's program service available from National Educational Television. There are many who believe that if educational television provided no other service than filling the void just before the evening meal, its existence would be justified.

III

CAPITAL REQUIREMENTS AND RECOMMENDATIONS

Relationship of Open-Circuit and Closed-Circuit Television

Much confusion exists concerning the two principal means of television transmission, i.e., open-circuit and closed-circuit television. Each system has distinct advantages and disadvantages. The choice between them rests largely upon the purposes for which they are to be used.

Both systems require standard television equipment to originate the signal -- studio cameras (either Image Orthicon or the less expensive and less flexible Vidicon cameras), television film chains, videotape recorders, etc. -- and standard television receiving sets at the point where it is to be viewed. The difference between the two systems lies in the means of carrying the signal from the point of origin to the point of reception.

The most commonly used system of conveying television signals is open-circuit television, the system by which most people receive their television programs from commercial stations. Open-circuit television employs television transmitting equipment which sends the signal through the air to be received by anyone with a television receiver within the service area of that transmitter.

Because the airwaves carrying the sound and the picture are owned by the people, and are in limited supply, their use is strictly regulated by the Federal Communications Commission through a system of licenses.

The advantages of open-circuit television are readily apparent: (1) there is no limit upon the number of receivers; anyone with a receiving set within signal range of the transmitter can be a viewer; (2) the number of receivers can be increased at no additional cost to the broadcaster.

Its major disadvantages are, first, the cost of the transmitting equipment, and, second, the fact that each transmitter is capable of broadcasting only a single signal at one time.

By its simplest definition, closed-circuit television is a system in which the television signal is carried from the point of origin to the point of reception by means of a cable. The cable system may carry the signal from one room to the next in a given building, may link all the rooms in a building, or may join many buildings together.

The cable system can be privately owned, or may be leased from the telephone company. In either case closed-circuit television does not require the permission of the Federal Communications Commission to install or operate.

Its major advantages are (1) its ability to carry several television signals at the same time, permitting the simultaneous transmission of more than one lesson, and (2) the fact that it does not require the construction and operation of expensive television transmitting stations.

Because there is no reception of the signal unless the receiver is connected to the cable system, reception is limited to those within reach of the cable.

The relatively high cost of cable installation or rental usually limits the points of reception to well selected locations within close range of the point of origin. It would be prohibitively expensive, for example, to extend a closed-circuit system to the Neighbor Islands of Hawaii.

Normally, it would be prohibitively expensive to include private homes in any closed-circuit system; however, an unusual situation exists in Hawaii in the plans of the Kaiser Companies for a housing development near Honolulu.

Hawaii-Kai Closed-Circuit System

Within a short distance of Honolulu, in an area around Koko Head and extending to Makapuu Point, Henry J. Kaiser is constructing a housing development that will ultimately comprise at least 15,000 homes and a proportionate number of schools.

The development is known as Hawaii-Kai. Amongs its unusual features is a plan to equip each of the homes and schools with a closed-circuit television system capable of carrying twelve programs simultaneously.

The rate of construction of Hawaii-Kai is dependent upon the demand for the homes. At this writing less than fifty homes have been built, and the immediate rate of growth would appear to be rather slow. Because the area in which Hawaii-Kai is located is almost devoid of television reception from Honolulu's three commercial stations, the use of this closed-circuit cable will be restricted initially to a community antenna system, providing reception of Honolulu's three stations -- and the educational channel when it is constructed -- to the homes of Hawaii-Kai.

This phase of the development is under the supervision of Kaiser-Teleprompter, a jointly owned subsidiary of Teleprompter, Incorporated and Kaiser Industries.

Mr. Kaiser, never one to be deterred by the magnitude of the immediate problems, foresees the day when Hawaii-Kai's growth will justify the expansion of this closed-circuit system to provide two additional television services: pay television (under a system known as Key-TV), and closed-circuit educational television.

At such time as it becomes possible to inaugurate the expanded service, the schools located within Hawaii-Kai[1] will have a rare opportunity to use these channels for experimentation in closed-circuit instructional television, teaching machines, and other newly developed teaching aids employing electronic transmission. That day would seem to be several years away, however.

Closed Circuit Television Equipment

We recommend that the educational establishment in Hawaii, and particularly the State Department of Education, prepare for that day through the development of programming and production resources.

Closed-circuit channels are valueless unless the machinery exists to program these channels -- cameras, studios, videotape recorders or film chains. Multiple channels require multiple equipment, and equipment selected for broadcast purposes should bear this special need in mind.

We are prompted to add a word of caution on the multiple uses of television equipment. Each television device has its own special purpose; some types of equipment are more flexible than others.

It is obvious to point out that a college would not buy a truck for its president just to gain flexibility of use. The constant demand for the truck from two or more sources would leave all sources unsatisfied, to say nothing of the unsuitability of a truck for most college presidents.

The analogy is not so broad as to lose its application to television equipment. The more expensive television equipment is more flexible. However, it would be uneconomic to use expensive equipment where less expensive equipment would suit the special purpose adequately. This principle applies only so long as special purpose equipment is not used in a variety of applications for which it is not suited.

The Survey Team noted the appropriation made by the Hawaiian

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[1] At least one other housing development on Oahu has announced similar plans for closed-circuit television.

Legislature to the University of Hawaii for the purchase and installation of a closed-circuit television system in the College of Education. This equipment will make it possible for student teachers to view demonstration teaching classes without actually being present in the demonstration classroom. The system is quite adequate for this purpose.

It does not necessarily follow, however, that the possession of television equipment by the University puts it in a position to engage in other forms of educational television. Not only will the demands upon the equipment for its primary purpose limit its availability for other purposes, but the type of equipment to be used is not suitable for all other purposes. Additional equipment will be required as additional needs are discovered. The selection of this equipment should be suited to its purpose.

Capital Costs

A complete open-circuit educational television system requires a capital investment that will provide facilities for (1) producing the program service, (2) transmitting it to the point of reception, and (3) receiving it in the home or classroom. The capital investment for reception in the home is normally made by the individual, so we are concerned here only with the investment for receiving sets in the public schools. Each of these investments is considered in turn.

PRODUCTION FACILITIES

The production facilities are those which originate the picture and sound information to be broadcast to the home or school viewer via the transmission facilities. It includes the equipment and housing necessary to originate live, videotape and film programs.

The size of the production facilities proposed here is based not only upon the experience of other ETV stations serving communities of a similar size, but also upon the type of programming likely to be offered. It takes into account the probability of both an instructional television service as well as the more general community programming.

It is assumed here that we are dealing with a single production facility to be located in Honolulu. The Survey Team saw no need in the immediate future to build production facilities to originate programs on the Neighbor Islands. Since the prime factor governing the location of this facility is the availability of an adequate building, specific location of the building was not considered. Suffice to say that it should be located either immediately adjacent to the transmitting facilities or at such a location that a single-hop microwave connection can be made.

1. Building Size

Television production is a space hog. If there is one fact that television broadcasters agree on, it is the unhappy fact that no one seems to have enough operating room. This is particularly true of most ETV stations, since the amount of live programming is invariably higher than the average local commercial station. And live programming, requiring -- as it does -- large studio areas and the ancillary property storage and equipment areas, necessitates a larger production facility than that allowed by the average commercial station.

A larger studio area usually results in a lower operational cost as far as television production is concerned. A small studio requires that the stage set for a regularly repeated program be dismantled after each use, and re-set and re-lit the next time it is used. This obviously requires a large expenditure of man-hours. This waste can be almost eliminated if the studio is spacious enough to allow the set to remain in one location permanently. This procedure also allows for decreasing the staging storage area by a proportional degree.

A minimum of two studios is recommended to enable independent use of the total studio area. For example, a program could be aired in one studio while preparations for an up-coming show are being made in the other. The preparation time for a live show, particularly stage setting and lighting, should not be underestimated. Other functions in which the independent studios are valuable include rehearsals, meetings, educational tours, auditions, etc.

The proposed studio sizes are offered only as a rough guide, to be modified by many obvious factors not now at our disposal. We propose one studio of 4,000 square feet floor area and a second of 2,500 square feet. The ceiling height should be at least 20 feet to allow for a nominal lighting grid height of 15 feet. This grid height is essential in the proper lighting of the larger musical and dramatic shows.

The studios should be at ground level to allow for truck and auto access, both for programming and delivery purposes.

A staging storage area of 2,000 square feet should be allowed for the two studios, with another 1,500 square feet for the staging construction area and art department.

A single control room to serve the two studios should have at least 1,500 square feet. This control area would contain all the camera control and audio equipment, two film projection chains, and one videotape recorder.

An engineering shop and storage area of 1,000 square feet is suggested. In addition, 400 square feet is needed for film editing and viewing. If an audience viewing room, overlooking the studios, is available it may consume another 500 square feet. Videotape and film storage may require 200 square feet.

The remaining space would be allocated to offices, conference rooms, reception area, lobbies, dressing rooms, etc.

2. Studio Acoustics

Complete acoustical treatment is mandatory. This treatment involves not only insulation from outside sounds (achieved primarily by walls with mass) but also internal treatment to decrease reverberation time of the studio (achieved by sound absorbing material on the studio walls and ceiling). It is suggested that a reverberation time of .6 seconds be used as a design center. Particular attention must be paid to the elimination of low frequency rumble to be expected from an extensive air conditioning system.

3. Air Conditioning

The Honolulu Weather Bureau records a long-term average temperature of 75 degrees. Were it not for an average daily relative humidity of between 58% and 73%, it would not be necessary to propose as extensive an air conditioning system as we are suggesting.

However, because of the humidity and its effects upon both personnel and equipment, it will be necessary to provide at least 50 tons of cooling for the production facilities cited above. Many studies of equipment failure have conclusively shown that heat is the principal cause. An adequate air conditioning system is well worth its initial high cost.

4. Studio Design

Because of the lack of relevant facts, no attempt will be made here to go further into the actual design of the studio. It must be pointed out, however, that proper television studio design is not an easy thing to achieve. It is a combination of electronics, stagecraft, acoustics, lighting and architecture.

There are very few architects who know enough about television production and electronics. There are not many television engineers who know much about building design. The logical solution is a close working relationship -- beginning at the planning stage -- between an experienced television broadcast engineer and a competent architect.

5. Estimated Capital Costs of Production Facilities

The equipment and facilities proposed here are those which we feel are minimum to provide two to four hours of live broadcasting a day, with film and videotape being used for the remaining portions.

As in the case of the transmission facilities, only the highest quality broadcast equipment should be considered to decrease long-term maintenance costs. With regard to equipment, it is generally best to obtain information from operational personnel or consultants, rather than sales people.

Studio building.............................. based on the size of building indicated above and on present Honolulu construction costs; includes power installation for both equipment and lights; includes 4, 000 square feet office space; excludes land, utilities, and grounds improvement		$375, 000
Air conditioning..............................		22, 000
Lighting....................................... control panel, cables, grid, 125 lighting units		32, 000
Staging equipment and tools..................		3, 500
Engineering shop and test equipment.......... 3 test scopes, sweep generator, VOM's, VTVM's, miscellaneous test equipment, tools, etc.		12, 000
Film editing and viewing		2, 500
Control room and studio		
3 Image Orthicon camera chains.......	$51, 000	
Camera mounting equipment..........	1, 500	
Video switcher.....................	7, 500	
Master control equipment............	15, 000	
Telecine (2 vidicon, 2 16mm film projectors, 2 slide projectors).........	33, 000	
Video tape recorder.................	55, 000	
Audio console, 2 turn tables, 2 audio tape recorders....................	6, 500	
Studio-transmitter microwave link....	11, 500	
Microphone boom....................	2, 400	
10 microphones.....................	1, 000	
Studio and house monitors............	17, 000	
Rear screen projector with screen....	3, 500	
Video and audio terminal equipment and racks............................	25, 000	229, 900
TOTAL CAPITAL COSTS FOR PRODUCTION FACILITIES		$676, 900

TRANSMISSION FACILITIES

Transmission facilities are those which convey the picture and sound information from the production facilities to the receiving set of the home or school viewer. Included are interconnecting microwave systems, transmitters, translators, and repeaters.

The portion of the radio spectrum allocated to the broadcast television service by the FCC has propagation characteristics very much like light. In other words, the signals do not have a great propensity to bend. Because of this characteristic most television reception is limited to either line-of-sight or to a reflected signal. This is the greatest deterrent both to long-distance television reception and to total reception coverage within short distances from the transmitter.

Hawaii is probably one of the most difficult areas in the world for a simple, complete television coverage. Not only does the topography of the islands block many of the communities from reception but the sheer distance of the four main islands from each other -- about 375 miles tip to tip -- requires complex transmission facilities to achieve minimum coverage.

The propagation problems and proposals for transmission facilities for the main Hawaiian Islands will be dealt with separately.

1. Oahu

The Island of Oahu, with almost 80% of the State's population, will undoubtedly be the center of the educational television system. The island consists of two parallel mountain ranges connected by a "saddle" -- the Schofield Plateau. The city of Honolulu itself contains over half of the population of Oahu.

The three commercial television stations now operating (channels 2, 4, and 9) have located their production and main transmission facilities on the flatlands near the bay in Honolulu. For the most part, these facilities provide adequate coverage to the city of Honolulu.

Adequate coverage also extends to Barbers Point and to Wahiawa. Many of the deep valleys in the Honolulu district -- such as Manoa, Aina Haina, and Kalihi -- offer difficult reception problems. The Waianae district to the west, and the entire windward side of the Koolau mountain range, have very spotty reception, and in some areas no reception at all, of the Honolulu stations. Reception in the far northwest Waialua district is almost completely absent.

We made an extensive study of the advantages and disadvantages of locating the transmitter in a location other than the location chosen by the commercial stations. In particular, two locations seem to offer certain advantages: Diamond Head to the southwest of Honolulu and Mount Tantulus above Honolulu in the Koolau range.

Of the two, Diamond Head appears to offer the greatest advantages. Its prime advantage over the commercial station locations is height -- some 700 feet above sea level. This height would offer somewhat better coverage of Oahu in general.

It would enable many of the valleys in the southwest section of Oahu to get better reception and, at the same time, would undoubtedly increase the signal strength in the Waialu district. It would not, however, provide satisfactory reception on the windward side or the Waianae district.

One disadvantage of this location is the necessity of separating the production and transmission facilities. We were not able to determine if the Diamond Head site is presently available for use as a transmitting site.

The location on Mount Tantulus with a tall tower (probably 1,000 feet) offers a means of much more extensive coverage of Oahu with a single transmitter. A tall tower would be necessary to cover the windward side adequately.

It does, however, have the same separate facilities problem of the Diamond Head location of separation of production and transmission facilities. In addition, the expense of the tower -- both capital investment and maintenance -- would tend to rule out the somewhat dubious advantages of the location. It appears more sensible to cover the windward side of the island with a repeater signal from the island of Maui. Where this repeated signal is not consistently received (such as at Kaneohe), translators or community antenna systems should be utilized.

There is no single transmitter location on Oahu which will adequately cover the entire island. There is a tendency for one not accustomed to the difficult terrain of the Islands to think of transmission tower height, in itself, as an advantage. This is not the proper approach when dealing with deep set valleys, tall mountain ranges, and extensive flat lands.

Our proposal for the location of the main transmission facility on Oahu is in the approximate location chosen by the commercial stations. This choice is not ideal, but takes into consideration both the factors of propagation and economics.

We specifically recommend that the top of the Hilton Hawaiian Village Hotel be considered for the transmission facilities. At the present time a television tower is located there. This tower was formerly used by a commercial station but was abandoned when the hotel was sold to a different organization.

Since the location has been proven in actual operation to be adequate, we propose that it be considered as the first choice. The hotel management has indicated that the space would be available on a lease basis.

Although space is available in the hotel for transmission facilities, there is none for production facilities. Therefore, production facilities would have to be separate, but even under these circumstances the production facilities would be closer to the transmitter than with either the Tantalus or Diamond Head locations.

In our opinion the commercial stations are, with the exception of channel 9, underpowered. Originally this was certainly a matter of economics.

We propose that the transmitter on Oahu, which would be on channel 11, have a minimum of 150 kilowatts effective radiated power. It is further proposed that it be accomplished with a transmitter power of 25 kilowatts and an antenna with a gain of 6 or more.

We suggest that the only feasible way to provide coverage to the Waianae district is by translator or a community antenna system.

In short, our proposal for the transmission facilities of Oahu is:

1. The principal transmitter on channel 11 located in the Honolulu area;
2. A translator on the Waianae range to cover the Waianae district;
3. Coverage for the windward side of the island from the repeater on Maui and, where necessary, spot-filling with a translator.

2. Maui

There is only one logical location for transmission facilities on the island of Maui: on the summit of Mt. Haleakala, where the three commercial stations have repeaters. This site, 10,000 feet above sea level, provides the key component for coverage not only of the major proportion of Maui, but also for the windward side of Oahu, the island of Molokai and Lanai, and a large section of the Island of Hawaii. In addition, it also provides the signal for the repeater transmitter in Hilo, Hawaii.

As in the case of Oahu, we feel that the commercial repeater stations on Maui are underpowered. We propose a minimum of 60 kilowatts effective radiated power on the ETV assigned channel 10.

Because of the height of the transmitter, the antenna should have no higher gain than 6 unless null fill is used.

This system will provide excellent coverage of the principal areas of Maui with the exception of a portion of the sparsely populated southwest section and the Lahaina district. The latter would receive an adequate signal coverage from the main transmitter on Oahu.

Because of the adjacencies of the FCC channel allocations, there may arise difficult problems of interference with the pickup of the channel 11 Oahu signal on top of Mt. Haleakala. It will undoubtedly be necessary to provide a reception point at some distance down the mountain from the transmitters. Once the channel 10 repeater goes on the air the commercial stations will also experience similar problems. This will probably result in the necessity for them to relocate their reception locations on Mt. Haleakala.

Since there is no space in any of the commercial station repeater installations on top of Mt. Haleakala for an additional transmitter system, it will be necessary for the ETV system to provide its own building.

Because of the height of the mountain, a tower installation will not be necessary. In fact, with the wind problems, it is an advantage not to have a tower. The antenna should be mounted a short distance off the ground on a simple but massive concrete base.

The commercial power facilities are sufficient to absorb the added load presented by an additional transmitter on Mt. Haleakala. However, because of the very isolated location, emergency generator provisions should be included for light and power for the safety of the transmitter personnel.

This emergency power is not for operation of the transmitter. Since by law a VHF repeater transmitter must be manned, the building must provide some form of living quarters, i. e., food and sleeping facilities, restroom, car port, etc., for transmitter personnel.

3. Hawaii

The northwest section of the island of Hawaii will be covered by the reception of channel 10 from Maui. This reception area runs approximately from Honohina on the northeast coast to the South Kona District on the west coast. To provide reception to the southwest section of Hawaii is another problem.

The channel 4 ETV allocation for Hawaii should be located in Hilo to cover this major population area. Once again, as in the case of Oahu, because of the unique topography of the area, it would be preferable to locate the transmitter near the ocean on one of the out-jutting land points such as Coconut Island or Leleiwi Point. The tower should be at least 100 feet high. Special provisions must be taken for wind load because of the violent wind and tidal wave conditions.

It is proposed that the transmitter have an effective radiated power of 6 kw to be obtained with a transmitter power of 2 kw and antenna gain of 3.

To adequately cover the area from the Kilauea Volcano to Naalehu it will be necessary to resort to at least two translator installations. The first translator, rebroadcasting the Hilo signal, would be in the area of the Volcano itself, beamed about 225 degrees true north.

The second will be located in Naalehu itself and would rebroadcast the repeated signal from the first translator. This translator would be directed toward Pahala -- about 45 degrees true north. Both translators should be 10 watt units.

The remaining significant area not yet covered is in the Waimea section in the northwest. This section should be covered with a 10 watt translator on the Kohala Mountains beamed directly down into Waimea. It would pick up its signal directly from channel 10 on Maui rather than from Hilo.

One problem still remains for the coverage of Hawaii. The channel 4 repeater in Hilo cannot directly receive the signal to be rebroadcast from Maui. The commercial stations solve this problem in two different ways. The first has a receiving station and microwave installation at the 8, 300 foot level on Mauna Loa (31 Miles west of Hilo). The signal is microwaved from this location to the transmitter in Hilo.

Since no commercial power is available at this pickup location, complete dual generator facilities are necessary. Because of the remote location and the necessity to provide private power, there have been problems in maintaining continuous and high quality service.

The other commercial station picks up the signal from Maui at Honohina on the northeast coast, feeds it via a translator down to Pepeekeo and then relays it via microwave to their Hilo transmitter.

It is proposed that the ETV system proceed in the following manner: Once the transmitter is on the air in Oahu, signal strength readings of the Oahu signal should be made at a high level on Mauna Loa.

If (1) sufficient signal strength is available from Oahu, and (2) commercial power is then available (it is our understanding that commercial power is now being considered for the top of Mauna Loa), and

(3) adequate microwave contact can be maintained with the transmitter location in Hilo, this method of signal pickup for Hilo should be chosen.

The method has two advantages over the one to be proposed in the next paragraph; namely, the signal is obtained directly from Oahu and does not depend on the operation of the Maui transmitter, and the signal goes through two fewer repeating operations with their attendant degredation of picture and sound. We recommend that the microwave system use 2,000 mc rather than 7,000 mc.

If the preceding plan proves to be unfeasible, it is proposed to pick up the signal from Maui along the northeast coast in the vicinity of Honohina, and go through two 10 watt translator installations along the coast toward Hilo. This is basically the same as the installation of the second commercial station cited above, except that it uses a simpler and less expensive translator to replace the microwave system.

The prime advantages of the coast relay system are those of good accessibility for installation and maintenance and the present availability of commercial power.

Passing mention should be made of the remote chance of picking up an adequate signal from Maui at a receiving location on the extremity of Leleiwi point. Were sufficient signal strength available at this location it would be by far the most economically advantageous method of getting the service to the Hilo transmitter.

4. Kauai

There is some rather spotty reception of the Oahu transmitters on the east coast of Kauai. However, it is not consistent enough to ignore the necessity of some form of rebroadcast facilities on the island. Because of the expense of the installation it is suggested not to consider utilizing the ETV allocation of channel 8. The main population areas (with the exception of the north and west areas from Moloaa to Mana) can be adequately covered with a minimum of one--or possibly two--translators.

The location on Mt. Waialeale of the commercial stations' translators, channels 70 and 74, appears to be quite logical. However, the location does present extreme maintenance problems since it can only be approached by foot or helicopter. In addition, the northern section of the island is not covered at all. Any coverage of this area would require an additional translator. The installation and maintenance problems of this translator would be at least as difficult -- if not more so -- as those of the southern translator.

There is some question whether or not a signal from the channel 11 transmitter on Oahu can be directly received at the translator location on Mt. Waialeale. It is proposed that no decision be made on the ultimate location of the translator until signal strength readings be taken of the Oahu station.

If sufficient signal is not available, either an alternate location should be considered or a second low power translator should be used to relay the signal from a good reception location to the high power (100 watt) translator on Mt. Waialeale.

5. Propagation Coverage

The following calculations of signal coverage of the islands by the proposed system of ETV are based upon general population rather than school building coverage. A study of the school building distribution as indicated in the State Department of Education School Directory of 1960-1961 indicates that there is very little discrepancy between the general population and school population distribution.

The general population densities were derived from the General Plan of the State of Hawaii as issued by the State Planning office, January, 1961.

Oahu	89%
Maui	95%
Hawaii	91%
Kauai	82%

The above figures are projected on these conditions:

1. Transmission facilities:
    a. Channel 11 transmitter and Waianae translator on Oahu
    b. Channel 10 transmitter on Maui
    c. Channel 4 transmitter, two translators in the south, and one translator in the Waimea section for the island of Hawaii
    d. One translator on Kauai
2. Adequate antenna facilities at the receiving locations

6. Miscellaneous Notes on Transmission Facilities

a. Two way intercommunication radio systems must be provided between the VHF transmission facilities on Oahu, Maui and Hawaii since the cost of leased telephone facilities is prohibitive.

b. When translators are used as relaying devices to other VHF transmitters (such as may be necessary on Hawaii), the ratio of visual to aural power in the translator should be increased to lessen the interaction of one upon the other.

c. Only the highest quality transmission equipment should be considered. There is always a certain amount of degradation of picture and sound even in the best equipment. When the equipment is serving in a re-broadcast function, as most of it will be on the Islands, it is essential to maintain the highest engineering standards in order that the signal on the "end of the line" will pass FCC requirements. Also, since much of the equipment is in remote locations, it is essential that it be conservatively rated and reliable in order to minimize the maintenance costs. No used, old, out-moded, or substandard transmitting equipment should be considered. It must all be capable of passing a standard NTSC color signal with negligible distortion.

7.. Capital Costs - Transmission Facilities

OAHU

Transmitter building. Since there are too many unknowns at this time, the cost of a transmitter building will not be projected.	
Antenna tower (assuming one has to be erected rather than leasing an existing one)...............	$ 17,000
Tower erection costs............................	9,000
Antenna (gain of 6)..............................	17,000
25 KW transmitter with spare tubes and parts.......	170,000
Transmission line, sideband filters, etc.	16,000
Video and Audio terminal rack equipment including test equipment and frequency-modulation monitors..	12,000
Tools and test meters............................	750
Transmitter power wiring installation..............	5,000
Visual sideband demodulator......................	2,500
Dummy Load....................................	4,500
Two-way radio intercommunication system.........	1,500
	$255,250

MAUI

Transmitter building - assuming similar quonset hut construction as the commercial stations now have on top of Mt. Haleakala: including minimal living quarters, car port, and power wiring	$ 4,500
Antenna base and erection costs..................	3,500
Antenna (gain of 6)...............................	17,000
10 KW transmitter with spare tubes and parts.......	95,000
Transmission line, sideband filters, etc.	7,500
Video and audio terminal rack equipment including test equipment and frequency-modulation monitor...	10,000
Tools and test meters..............................	500
Visual sideband demodulator.......................	2,500
Dummy Load.......................................	4,500
Two way radio intercommunication system...........	1,500
VHF receiving installation with equipment............	4,000
Emergency power generator for lights...............	750
	$151,250

HAWAII

A. Hilo:

Transmitter building	$ 5,000
Antenna tower (100 feet)	10,000
Tower erection costs and base	7,500
Antenna (gain of 3)	17,000
2 KW transmitter with spare tubes & parts	42,000
Transmission line, sideband filters, etc.	8,000
Video and audio terminal rack equipment including test equipment and frequency-modulation monitor	10,000
Tools and test meters	500
Visual sideband demodulator	2,500
Dummy Load	1,200
Two-way radio intercommunication system	1,500
	$105,200

B. Signal pickup installation for Hilo:

Plan A (Microwave from top of Mauna Loa - assumes adequate housing and commercial power):

One-hop microwave link to Hilo	$ 15,000
VHF receiving equipment	1,600
	$ 16,600

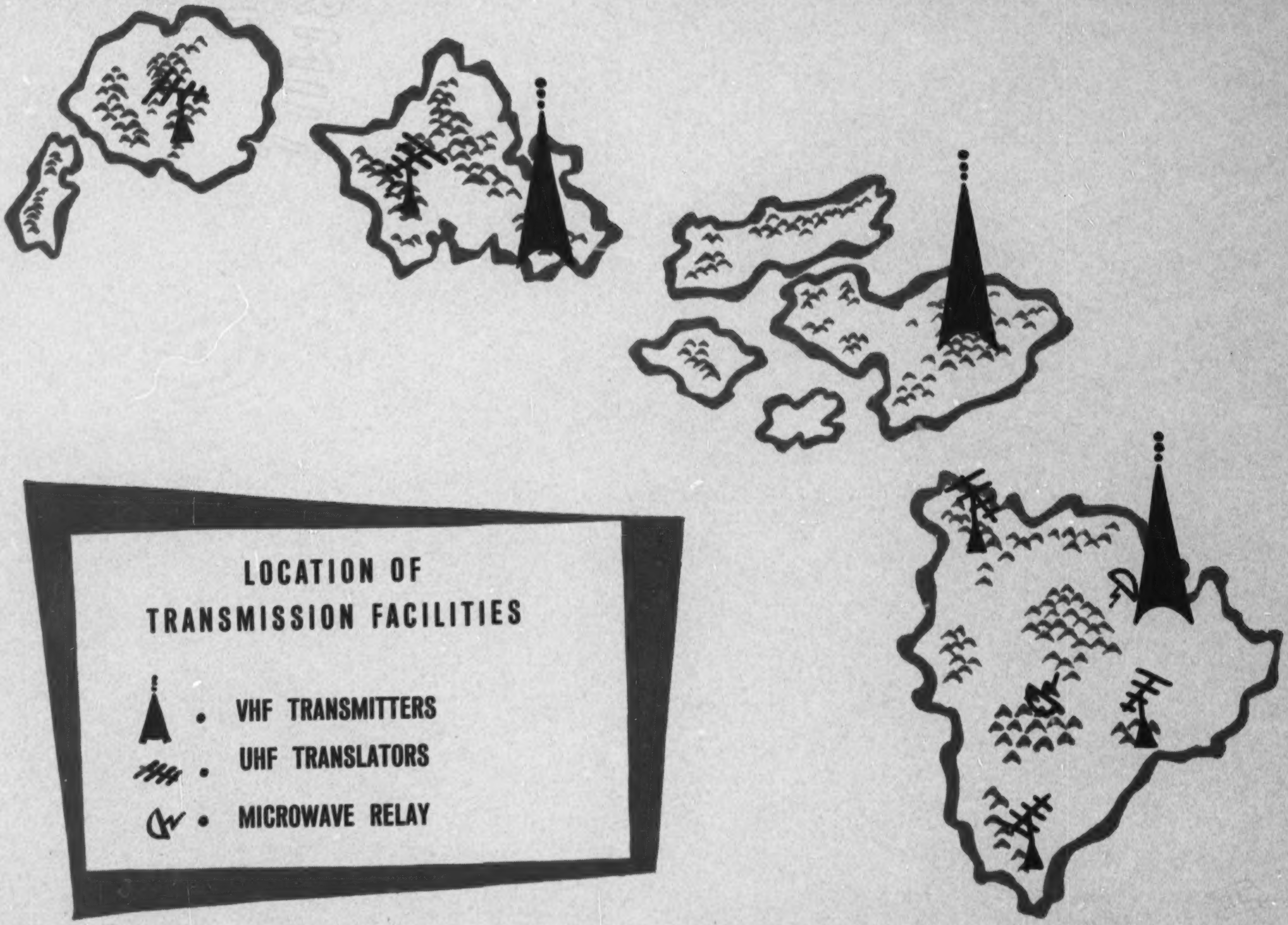
Plan B (Pickup Maui signal on East coast and relay via two translators to Hilo -- assumes adequate housing and commercial power):

Two ten watt translator installations with directional antennas	$ 18,000
VHF receiving equipment	1,600
	$ 19,600

C.	Southern island translators (2) assumes adequate housing and commercial power	$ 18,000
D.	Waimea Area translator -- assumes adequate housing and commercial power	9,000
	Total Hawaii (with Plan A)	$148,800

KAUAI

100 watt translator system - assumes adequate housing and commercial power	$ 15,000
TOTAL CAPITAL COSTS FOR TRANSMISSION FACILITIES ON THE ISLANDS OF OAHU, MAUI, HAWAII, AND KAUAI	$570,300


LOCATION OF
TRANSMISSION FACILITIES
VHF TRANSMITTERS
UHF TRANSLATORS
MICROWAVE RELAY

RECEIVING FACILITIES

We are concerned here only with the recommendations for the installation of receiving equipment in the public and independent schools for classroom viewing of instructional programs. It is assumed that reception of adult education programs and the general program service will be in the home, though consideration might be given to the necessity or desirability of providing adult television viewing centers in those areas where very few home receivers exist, or where reception of educational television in the home is impossible.

It is apparent from the foregoing recommendations on transmission facilities that areas of difficult reception will exist in certain parts of the Islands. Where these difficult areas exist, the schools will face the necessity of investing in more complex and expensive receiving equipment.

The cost variable in these instances will be the antenna installation; receiving sets will be standard regardless of location. In this respect, we would commend to your attention the counsel given by the Midwest Program on Airborne Television Instruction to its participating school districts:

> "Careful consideration should be given to the quality of the receiving system because the effectiveness of TV instruction is strongly affected by the clarity and reliability of both the sound and picture received in the classroom. A little additional money spent on better quality equipment at the outset can pay significant dividends."

Types of Receiving Installations

It is necessary to distinguish between two types of receiving systems in general use by schools for classroom television programs: (1) independent operation of each receiving set, with its own antenna, as is common in the home; and (2) a master antenna system with amplified distribution to each classroom by cable.

The former has the advantage of economy where there are only a small number of receiving sets in the school, and where reception problems do not require complex antenna installations for each set.

The master antenna system, while normally more costly, has the advantage of a single antenna installation (a particular advantage where reception is difficult) and greater control over the system to insure uniformly good reception in each classroom. In those schools where reception will be from translator stations, broadcasting in the UHF frequencies (as recommended on Kauai and in parts of Hawaii and Oahu), special VHF/UHF receiving sets will be necessary unless the master antenna system is used. With the master antenna system it is possible to convert the UHF signal to a VHF signal at the central point of reception in the school building, and distribute it to classrooms through standard VHF receiving sets.

Types of Receiving Sets

The standard type of receiving set in use in the home is adequate for classroom use provided the screen is not less than 21-inches and the speaker is mounted in the front of the set. It is important, however, to bear in mind the caveat expressed earlier on the ultimate value of quality equipment, and the importance of dealing with reputable and reliable manufacturers and distributors.

Some manufacturers are now making receiving sets especially designed for classroom use. While these sets are more expensive than the standard receiving sets, they have the added features of minimum reflection, lockable controls, modular construction for quick and easy maintenance, superior sound systems, and a number of safety factors.

Regardless of the type of receiving set used, it should be properly mounted for ease of viewing in the classrooms. Several varieties of mounts can be purchased from manufacturers specializing in this field. Useful information on the types of mounts, positioning of receiving sets, arrangement of seating, etc., can be found in the excellent report of the Educational Facilities Laboratory entitled, "Design for ETV: Planning for Schools with Television."

Number of Receiving Sets

Experience has proven that a single 21-inch receiving set is satisfactory for the normal classroom of approximately 30 students. The maximum ratio is 20 to 30 students for each set. Experiments have been held with large classes of 100 or more utilizing four or more receiving sets in the classroom, but the smaller classes are more effective for preparation and follow-up activities by the classroom teacher.

As to the number of receiving sets for each school, it is obvious that the ideal arrangement is one set for each room in the school. Since this is economically unfeasible for most school districts, we recommend that as many receiving sets as possible be installed in each school, with the absolute minimum set by a formula based either on the number of floors in the school (one movable set for each floor), or the largest number of separate classes that will be viewing television simultaneously (i. e., five receiving sets if there are five fourth grade classes in a given school), plus one spare set per building for immediate replacement of any faulty or ailing set in the classroom.

While movable receiving sets are possible, it is apparent that time is lost in shifting receiving sets between classes, to say nothing of the additional risk of damage to the set, so that permanently installed sets are to be preferred.

Cost of Receiving Facilities

Cost factors are, of course, variable with school locations and depend upon local prices, labor costs, etc. Experience of other schools throughout the United States would indicate that the following estimates provide an adequate basis for planning:

Standard receiving sets, with a suitable classroom mounting, may be purchased at from $150 to $200 each.

Special school receiving sets, with classroom mounting, are available at from $250 to $350 each.

Antenna installations will vary widely in cost depending upon their size and complexity, which in turn depends upon the difficulty of reception.

Master antenna and distribution systems will vary in cost also, depending upon the size and complexity of the master antenna. The distribution system will cost from $125-$400 for the central amplifier, and an additional $30-$50 to wire each established classroom into the system. (Wiring classrooms at the time the school is constructed is considerably less expensive.)

If the central system is also designed to convert the UHF signal to a VHF signal for distribution to the classrooms, it will cost an additional $150-$500 for a converter. The cost of the master antenna may run from $50 (for a simple installation) to as much as $500 (for a complex installation).

Financing of Receiving Equipment

The State Department of Education and the independent schools may wish to investigate alternative methods of acquiring receiving equipment to avoid the large initial outlay of equipping the schools by outright purchase.

Several companies offer either (1) rental of receiving sets, or (2) a lease-purchase plan to spread the purchase over several years. Other schools have been assisted in the acquisition of receiving sets by their Parent-Teacher Association, or by taking advantage of the provisions of the National Defense Education Act.

The total cost of equipping the schools of Hawaii with receiving equipment has not been calculated here because of the variables involved. This cost will be dependent upon the number and type of receiving sets and the complexity of antenna installations needed to provide satisfactory reception.

IV

COSTS OF OPERATION

Several studies have been made of the operating costs of educational television stations. The most recent of these[1] shows a wide variation in operating costs among the educational television stations now on the air.

Seventeen of the stations licensed to community corporations had annual operating budgets ranging from $76,000 to $1,010,000, with the median at $275,000. Nineteen stations licensed to colleges and universities had annual operating budgets ranging from $50,000 to $569,000, with the median at approximately $175,000. Eight stations licensed to public school systems had annual operating budgets ranging from $122,000 to $455,000, with a median at about $293,800.

Operating budgets for educational television stations can be as deceptive as they are variable. Some ETV stations, licensed to existing educational institutions, draw services and personnel from the parent institution, or occupy quarters in that institution, for which no payment is made.

Even those stations which are independent of this type of assistance depend heavily upon donations of equipment, services and personnel.

It is primarily for this reason, and secondarily for the economies of operation which ETV personnel have discovered out of sheer necessity, that operating budgets for commercial and educational stations are not comparable.

That is not to say, however, that educational television should be any less insistent upon maintaining high professional standards of performance, whether these standards are being applied to equipment, operating personnel, or the program which is the final products of their efforts.

Salaries are generally lower in educational television than they are in commercial television. The differential is usually justified by the "spiritual and moral rewards" of educational television. In this sense, the educational broadcaster finds close kinship with his colleagues in the academic cloister.

While this differential is likely to persist for some time, it should not be so great as to prevent the recruitment of high quality personnel into positions of responsibility in educational television.

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[1] Nelson, Lyle M., The Financing of Educational Television. Institute for Communication Research, Stanford University, California

It is important that these recruits possess the skills of television broadcasting, or have an aptitude for them. It is far more important, however, that they feel comfortable in the world of ideas, and are possessed of an almost compelling desire to communicate these ideas to others.[2]

Most educational television stations operate with some volunteer or trainee personnel. This has the double advantage of providing the station with operating personnel at no or little cost, and the individual with the experience he needs to get a paying position. We recommend that such volunteer personnel be used but that it be confined to those areas of operation where the lack of professional skill will not be made manifest on the air, and that a well-organized training program accompany their work program in order to give them and the station the opportunity of developing their individual capacities.

The recommended operating budget is derived from the experience of several existing educational television stations, and upon the following assumptions which the authors have made in the knowledge that any one of them may be changed by circumstances existing at the time that the state system comes into being:

1. A program service of approximately forty hours of programming each week confined to the five week days, and including instructional services for the schools as well as general adult programming (including the programs of the National Educational Television network);

2. A level of salaries consistent with the salaries being paid in the State of Hawaii at the time the survey was made;

3. No provision for contingencies, operating reserves, amortization of equipment, or capital purchases;

4. All major administrative services to be borne by the television station and not by outside agencies;

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[2] Particular care should be given to the selection of key technical personnel. Since it will probably be impossible to find experienced technicians in the Islands, supervisory personnel will have to conduct their own training programs, retraining to television those recruits from the allied communication fields of radio, stage and film. Supervisory technicians, as well as maintenance technicians who need a high degree of electronic skills to operate the complex transmission equipment, may have to be recruited from the mainland and should have the opportunity of visiting one or more ETV Stations before undertaking a personnel training program.

5. A system of production and transmission facilities consistent with those recommended in this report;

6. No provision for the payment of performers, including teachers, whom, it is assumed, will be drawn from the staffs of the public and independent schools.

Annual
Recommended Operating Budget

General and Administrative			$50,500
Salaries		$31,000	
General Manager	$15,000		
Secretary	4,000		
Business Manager/ Bookkeeper	7,000		
Clerical (2)	5,000		
Telephone, telegraph and postage		4,000	
Utilities and building maintenance		5,000	
Stationery and supplies		2,000	
Auditing and legal services		1,500	
Insurance		5,000	
Travel and personal expenses		2,000	
Program Production			$110,800
Salaries		78,800	
Program Manager	11,000		
Production Manager	9,000		
Producer/Directors (4)	26,000		
a) Art and Staging (2)	9,500		
Announcer/Music Librarian	6,000		
Film Supervisor	7,500		
Film Editor/Librarian	6,000		
Secretary/Traffic	3,800		
NET Affiliation Fee		10,500	
Production Materials and Supplies		6,000	

Film Rental		$2,500	
Videotape Stock		10,000	
Audio and Video Remote Lines		1,000	
b) Performers' Incidental Expenses		2,000	
Technical Operations			$147,500
c) Salaries		84,000	
Chief Engineer	$11,000		
Transmitter and Studio Supvs (2)	13,000		
Studio Technicians (8)	40,000		
Maintenance Technicians (6)	36,000		
d) Studio Equipment Maintenance		22,000	
Transmitter Equipment Maintenance		25,500	
Program Promotion and Publicity			14,000
Salaries		10,000	
Publicity Specialist	$6,500		
Secretary/Typist	3,500		
Printing and Mailing		3,000	
Photography and Supplies		1,000	
TOTAL ANNUAL OPERATING BUDGET			$322,800

NOTES:

a) Assumes the availability of unpaid volunteer personnel to serve as floor directors, stagehands, etc.

b) For the payment of telephone and travel expenses of performers.

c) Technical personnel requirements:

Oahu -- Production and Transmission Facilities

1 Chief Engineer
2 Supervisors

8 Operational Technicians
2 Maintenance Technicians

Maui -- 2 Maintenance Technicians

Hawaii -- 2 Maintenance Technicians

d) The yearly costs given here are for equipment parts only. Excluded is any consideration of labor costs since, with few exceptions, all maintenance will be done by the engineering staff. The exceptions might include the maintenance of the translator station on Kauai, painting of transmitter towers, etc. The estimated costs for the maintenance of Studio Equipment includes a provision for the replacement of image orthicon tubes. The maintenance costs on transmission facilities break down as follows:

Oahu	$ 9,500
Maui	7,000
Hawaii	7,500
Kauai	1,500
Total	$25,500

Videotape and Kinescope Library

The survey team was specifically requested to investigate the costs of organizing a videotape and kinescope library of instructional materials for re-use in the instructional program of the state educational television system. No provision has been made for such a library in the foregoing budget other than the provision for the purchase of raw videotape stock to record those instructional programs which will have re-use value in succeeding school years.

It seems to us no longer necessary for an educational television station to build and maintain its own extensive library of instructional programs except for those instructional programs which are particular to its own curriculum needs. Most of the sixty educational television stations now on the air, and several of the closed-circuit systems, have developed libraries of recorded materials which are equally suitable for use on other stations.

A recently published report[2] reveals an impressive inventory of instructional programs which are available for exchange among educational television stations, with additional courses being added each year. Among those now available are ninety-six courses at the elementary level, seventy at the secondary level, seventy at the college level, and eleven recorded courses for in-service teacher education.

The mechanism for exchange, and the price structure, has yet to be fully worked out, but it is anticipated that the National Educational Television and Radio Center will develop and announce such a plan early in 1962. When it is developed, it will be possible for the schools of Hawaii to take full advantage of the library of courses produced elsewhere.

Another valuable source of such materials is the Midwest Program on Airborne Television Instruction. This organization is making available to educational television stations the courses it has developed for its own use. A catalogue of the first fifteen courses consisting of 1,334 telecasts, including a schedule of rental fees, was published early in 1961.

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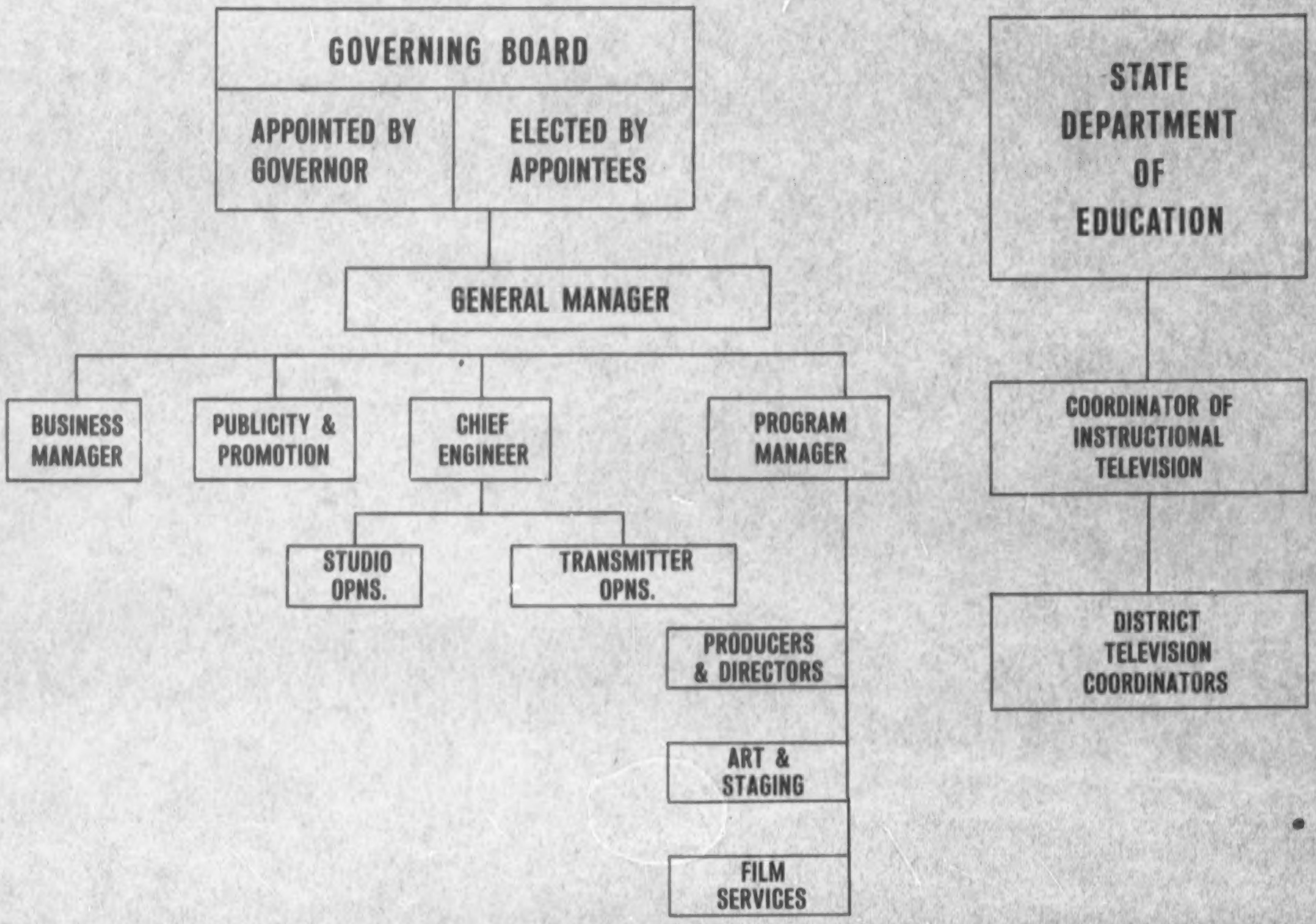
[2] A Study of the Use of In-School Telecast Materials Leading to Recommendations as to Their Distribution and Exchange, University of Nebraska in cooperation with the U. S. Department of Health, Education, and Welfare, 1961.

ORGANIZATION PLAN



GOVERNING BOARD

APPOINTED BY GOVERNOR

ELECTED BY APPOINTEES

GENERAL MANAGER

BUSINESS MANAGER

PUBLICITY & PROMOTION

CHIEF ENGINEER

STUDIO OPNS.

TRANSMITTER OPNS.

PROGRAM MANAGER

PRODUCERS & DIRECTORS

ART & STAGING

FILM SERVICES

STATE DEPARTMENT OF EDUCATION

COORDINATOR OF INSTRUCTIONAL TELEVISION

DISTRICT TELEVISION COORDINATORS

V

ADMINISTRATIVE CONTROL AND FINANCING

Statewide Educational Television Network

Since the advent of educational television in 1952, at least four systems of administrative control have grown up, each designed to meet the particular needs of its own situation. The Federal Communications Commission, in its Rules and Regulations governing the licensing and control of educational television stations,[1] purposely left the provisions of the law sufficiently broad to care for local and regional differences while insuring the use and control of the valuable reserved channels to legitimate educational organizations.

About one-third of the existing educational television stations are licensed to and controlled by institutions of higher education. These stations are largely in those communities where there is a major state or private university (e. g., the University of Wisconsin, University of Illinois, University of Houston, etc.). The control and financing rests with the governing body of the institution, and is exercised through a director who is a member of the institution's staff.

A smaller number of stations are licensed to school districts, and, like the university stations, are controlled and financed by the governing board of the district.

Another one-third of the stations are licensed to community non-profit corporations. For the most part, these stations are located in metropolitan communities where there is a large complex of educational and cultural institutions; the mechanism of a community corporation has been employed to assure each of these institutions equal access to the station's facilities.

The community corporation stations are financed through a combination of program contracts with schools and colleges and some form of public subscription. Control is exercised by an elected or appointed Board of Directors, comprising leading citizens of the community, through a paid professional staff responsible only to the Board.

The fourth method of control, representing a small but important segment of the educational television establishment, is through a state educational television commission. The state of Alabama, for example, operates a network of stations covering 80% of the population of that state.

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[1] See Appendix B.

Control of this network resides in the Alabama State Educational Television Commission, a body of five citizens appointed by the Governor - with the advice and consent of the State Senate - whose members serve for terms of ten years. The network is programmed through a committee representing the major educational institutions and school districts of the state. The Alabama State Network is financed by legislative appropriation.

While the State of Hawaii reflects similarities to each of the situations described above, it also possesses some unique differences: The public schools of the state are under the control of a single Board of Education and Superintendent; the University of Hawaii is the only state institution of higher education in the state; an unusually high proportion of the state's children are enrolled in one of the many independent elementary or secondary schools; and the cultural resources of the state are heavily concentrated in one city, Honolulu.

The Survey Team found a considerable resistance on the part of the representatives of these cultural institutions and the independent and parochial schools to the idea of an educational television network controlled either by the State Department of Education or the University of Hawaii. We did not interpret this resistance as a criticism of either institution, but rather as a criticism of the strong control and influence exercised by the State Legislature upon both institutions.

The feeling was best expressed by a fear that an educational television station, controlled by either institution, would be precluded from broadcasting programs of public discussion upon sensitive and highly controversial issues that in some manner might offend a single legislator. While experience does not fully bear out the fears of those who believe that state control necessarily implies a subtle sort of censorship, it is significant, we feel, that the outstanding educational television programs of public discussion on existing ETV stations in the United States have been produced largely by those stations which are independent of such control.

The Survey Team feels this is only one of many factors which must be considered in selecting the method of control appropriate for the State of Hawaii.

Our investigations revealed an almost unanimous consent to the concept of control by a representative body of the educational and cultural institutions of the Islands. Since the ultimate form of representative body must be governed by appropriate state statutes, and possibly by the organization of state government itself, we did not feel it appropriate to go beyond a broad description of the type of representation desired, and the suggestion of one method by which it might be achieved.

Specifically, we recommend that, within the framework of appropriate statutes, a state council, commission or foundation be formed of not less than seven nor more than thirteen citizens, a bare majority of whom would be appointed by the Governor of the State of Hawaii, and the balance elected by the persons so appointed.

We further recommend that, in selecting the persons to be appointed, the Governor draw these appointees from among the administrative staffs or governing bodies of (1) the two principal users of the television network, i. e., the State Department of Education and the University of Hawaii; (2) the other educational institutions of the state, i. e., the parochial and independent schools and colleges; (3) the cultural institutions of the state, i. e., the Honolulu Symphony Orchestra, the Honolulu Academy of Art, the Bishop Museum, etc.; and (4) the civic and educational associations of the state, i. e., the Congress of Parents and Teachers, the Junior League, American Association of University Women, service clubs, ethnic associations, etc.

All appointments and elections of the members of this council should be for stated terms, with the initial appointments made for staggered terms to provide for the retirement of only a portion of the council each year.

We further recommend that the group so formed be empowered to elect its own officers, and to employ appropriate professional staff for the conduct of its business and the operation of the statewide educational television network, including the operation of the studio production facility in Honolulu.

This body should be so constituted that it could legally (1) contract with public and private schools for the production of instructional programs, (2) accept and disburse public monies, (3) solicit and disburse funds from individuals, corporations, foundations, etc., and (4) contract with other agencies, including National Educational Television, for the broadcast of programs originating outside its own production facilities.

It is to be hoped that such a governing body would concern itself with matters of broad policy, delineation of programming objectives, financing and administration, and the resolution of conflicting interests among its participating institutions, and delegate to its professional director or manager the details of operations including the selection of programs to be broadcast. Policy determination by a committee structure is democratic and desirable; programming a television station by a committee is often disastrous -- and frequently results in bland and uninspired programs.

The State Department of Education

The involvement of the State Department of Education in the extensive use of instructional television implies certain internal functions of administration and control that are separate and apart from those of the educational television network. They include such matters as the selection of the curriculum for television, the selection and television training of studio teachers, the organization and publication of teachers' guides and study materials, supervision of the production of television teaching programs, effective utilization of the programs in the classrooms, and the relationships of the Department with the television station, the schools outside the Department, and the University of Hawaii.

A. Coordinator of Instructional Television

The authors recommend that the responsibility for these functions be vested in a newly created position of Coordinator of Instructional Television for the State Department of Education, reporting directly to the State Director of Curriculum.

We visualize the primary duties and responsibilities of the Coordinator of Instructional Television to include, but not be limited to, the following:

1. To work with the Assistant Superintendent for Curriculum, Instruction and Guidance, and with his Deputies and advisors, on the overall design of the instructional television curriculum for the school year;
2. To work with the appropriate Department Director and Subject Area Supervisor on the design of each specific television course;
3. To work with the Subject Area Supervisor, his curriculum advisory committee, and the program producer in the selection of the studio teacher;
4. To assist the television teacher and his advisors in the preparation and publication of teacher's study guide materials and classroom teaching aids;
5. To work with the Director of Audio Visual Education in the selection of effective visual materials for the television presentation;
6. To work with the production staff of the television station in the supervision of television presentation to insure both high quality teaching and television;
7. To coordinate the curriculum needs of the State Department

2

of Education with those of the participating independent and parochial schools;

8. To maintain close liaison with the College of Education of the University of Hawaii in the design and presentation of televised in-service education programs for teachers;

9. To institute and maintain a statewide training program for classroom teachers in the effective utilization of the television lessons;

10. To supervise and assist the work of those at the district and school level who will bear the ultimate responsibility for effective day-to-day utilization of the television lessons;

11. To work with the Division of School Facilities Development of the State Department of Education in the design of special closed-circuit experiments when Hawaii-Kai and other housing developments offer that opportunity;

12. To work with the Information Specialist of the Department in keeping the public and the legislature fully apprised of the results of instructional television in Hawaii's schools.

13. To assist the schools in obtaining competent counsel in the selection and the purchase of television receiving sets, antenna installations, cables, etc.

Fortunately, the burden of these responsibilities is spread unevenly through the entire year: in the late spring and early summer the emphasis is necessarily upon the selection of curriculum and teachers, and the preparation of study materials; in the fall and winter it is upon the actual television production in the studio and effective utilization in the classrooms.

In selecting a person for this position, we recommend the following qualifications be emphasized:

1. Experience in educational television, with a working knowledge of television's demands and limitations, and preferably, experience as a program producer with instructional television (since, in the earlier stages, the Coordinator may very well be called upon to do program production work).

2. Experience in working with a state or district school system, with an appreciation of the needs of curriculum development and instructional techniques, and an ability to work harmoniously with administrators and teachers alike. While it is desirable that the Coordinator be a professionally trained educational administrator or teacher, it is not necessary provided his interests lie in this direction, and he is

emotionally capable of emphathizing with the interests of the professional educator.

3. Demonstrated ability as an administrator, capable of supervising the work of others, of handling the extensive administrative demands of correlating the work of educators on the one hand, and broadcasters on the other, and of keeping both hands fully informed.

4. A demonstrable knowledge of the literature of instructional television, its techniques, experimental results, equipment developments, and the postulates of its theoriticians.

B. Curriculum Coordination

The Survey Team feels no specific recommendations are necessary to effect a coordination of curriculum. Unlike other educational television systems, serving a complex of independent school districts, the statewide system of educational television in Hawaii would serve basically a single system under a single Superintendent.

We assume the machinery of coordinating curriculum is built into that system. We do suggest the Coordinator of Instructional Television effect whatever coordination of curriculum is desirable and necessary with those independent and parochial schools outside the jurisdiction of the State Department of Education who may wish to participate in the instructional television program.

The absence of a specific recommendation for curriculum coordination does not imply a lack of understanding for the need to maintain close and constant communication with the consumers of the service, i. e., the individual classroom teachers, through the District Offices on the several islands.

To be fully effective, this communication must be in both directions: from the State Office, full information to the teachers on plans and procedures; from the classroom, feedback to the producers of the programs on its effect, and suggestions for improvement.

C. District and School Supervision

It will be impossible for the Coordinator of Instructional Television in the State Office to maintain a close personal relationship with the individual teachers using the instructional television service.

We recommend, therefore, that one person in each district office be assigned the specific responsibility of supervising and assisting classroom teachers within that district in the most effective use of the television service. In addition to making visits to the classrooms to observe and assist, the supervisor in the district office should plan and conduct utilization workshops for the classroom teachers of the district, and should make recommendations to the State Office for improvements and changes in the service.

If it is not possible for one of the supervisors or field assistants now employed in the District Office to assume the additional responsibilities of supervising the classroom utilization, we recommend that a part-time consultant be employed in each District Office for this purpose during the initial stages of its development, with consideration of a full-time supervisor as the need increases.

D. Television Teachers

In selecting studio teachers, first consideration must be given to the teacher's mastery of the subject area to be taught. However, it is extremely important that equal consideration be given to the teacher's proven ability to communicate ideas by means of television.

The television camera is demanding and unforgiving; it tends to emphasize both the good and bad qualities of the teacher. Unfortunately, demonstrated ability in the classroom cannot be a valid index for success in the television studio, with its peculiarly cold and mechanical environment.

The odds, of course, favor the good classroom teacher over the mediocre or poor classroom teacher. Only by carefully planned auditions before the television camera can the final determination be made.

It is the essence of instructional television that the studio teacher have adequate time for careful and detailed planning and preparation of the television lessons. Preparation for television teaching is more complex than preparation for classroom teaching, hence it requires more time.

We recommend that teachers selected for television teaching be assigned this task on a full-time basis. Ideally, this full-time period would extend over a period of at least two years for a single year's course, providing time in advance of the telecasts for in-service preparation of the classroom teachers, development of the curriculum content, and preparation of the individual lessons; and time following the televised course for the development of additional teaching aids, continuing field work, and necessary revision of the lessons.

As a minimum, we would recommend full-time employment for a period that included at least six months preparation and planning time in advance of the first televised lesson.

In connection with the planning and preparation of television lessons, we would add one further recommendation. Recent experience has demonstrated that instructional television can be made far more effective when thought is given to the use of supplemental teaching aids in connection with the television lesson.

We have in mind such classroom aids as teaching machines, phonograph records, transcripts of broadcasts, supplemental printed materials, etc.

Where such aids are made available to the classroom teachers--as they are for example in the Heath-deRochemont produced series on conversational French, "Parlons Francais" -- they tend to enhance the television instruction, and result in more effective learning.

The University of Hawaii

Comparatively little thought has been given by the University of Hawaii to the possibilities of television in meeting the problems of growth and increased quality of education. As reported earlier, the College of General Studies evinced an interest in televised non-credit college courses for adults, and the College of Education, already embarked upon plans for closed-circuit television in pre-service teacher training, expressed an interest in the uses of open-circuit television for the in-service education of teachers.

Perhaps the greatest interest in television lies within the newly created East-West Center. This project for cultural and technical interchange views educational television as one means of acquainting Asian students with some of the finer aspects of American mass communications, as well as a demonstration laboratory for the potential which exists in television for meeting the problems of illiteracy and ignorance in underdeveloped countries. The East-West Center should also provide educational television with an exciting source of program material for national, as well as local, consumption.

In spite of these pockets of interest, however, there is a lack of coordinated long-range planning and thought among the departments of the University on the matter of television.

We recommend that the administration of the University give serious and immediate consideration to the appointment of a representative faculty committee to:

1. Coordinate and evaluate the planning now taking place in the several departments and colleges;

2. Examine the accumulated television experience of other colleges and universities, and recommend to the President both short-range and long-range applications of television to the needs of the University.

3. Encourage the faculty to give thoughtful consideration to, and experiment with, television as a means of upgrading the quality of learning;

4. Coordinate the future plans of the University in television to avoid the unnecessary duplication of equipment, overlapping of functions, etc.

The faculty committee on television may wish to examine the following possibilities in light of the University's needs:

1. The broadcast of credit telecourses to teachers and other adults unable to attend either campus of the University;

2. The broadcast of non-credit telecourses for general adult education;

3. The simultaneous broadcast to the Manoa and Hilo campuses of courses by those unusually gifted or specialized professors not available on both campuses;

4. The broadcast of evening lecture and concert series offered under University auspices and not generally available to all adults in Hawaii;

5. The broadcast of agricultural extension information to the farms of Hawaii;

6. The broadcast of certain lower division, large enrollment courses to students in their homes and living quarters as a means of making more efficient use of classroom space and faculty.

Financing the Educational Television Network

In the eight year span that encompasses the brief history of educational television[3], money to construct and sustain stations has been, and will continue to be, one of its most serious and difficult problems.

Few of the sixty stations on the air today are adequately equipped and housed, and possess dependable sources of income to sustain themselves, a fact that prompted one of ETV's enthusiasts to remark that "a good strong breeze would blow many of the stations away."

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[3] The first educational television station, KUHT, Houston, began broadcasting in 1953.

And yet, of the sixty-one stations that have come to fruition in the past eight years, only one has failed; the remaining sixty survive and serve, some against formidable financial odds, and are added to each year by at least ten new stations. The will to survive has oftentimes been mother to the means.

The initial impetus to station construction was provided by the Fund for Adult Education, an independent organization of the Ford Foundation. Grants up to $150,000 for the purchase of equipment were offered to each station that could match each grant dollar with two dollars or its equivalent in assets from local sources.

This shot of adrenalin into the financial bloodstream of educational television was an important factor in getting the first educational stations on the air. When these dollars were exhausted[4] educational broadcasters turned hopefully to the Federal Government for the "seed money" to stimulate further construction of educational stations on the channels set aside for this purpose.

Thus far their hopes of obtaining Federal aid have been raised in the Senate only to die in the House of Representatives. In the First Session of the 87th Congress, a bill (S205) providing $51,000,000 in aid was passed by the Senate on March 21, 1961.

This bill, commonly referred to as the Magnuson Bill, would grant each state up to $1,000,000 for station construction. Several counterpart measures were introduced into the House of Representatives. One of these (HR 132) was favorably reported out of the House Interstate and Foreign Commerce Committee and, at the close of the First Session, it was sent to the House Rules Committee.

At this writing it had not yet been reported out of the Rules Committee. This legislation -- known as the Roberts Bill -- differs in several major respects from its Senate counterpart: it provides less than half the total amount of aid money ($25,000,000), with no upper limit on the amount to be granted each state, but with the provision that each dollar granted be matched by local funds.[5]

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[4] The Fund for Adult Education went out of existence on June 30, 1961, and title to the equipment purchased with its funds, held for eight years from the date of the grant, has been transferred to the National Educational Television and Radio Center.

The ultimate fate of the Roberts Bill, or the character of the compromise bill that would result from conference committee if the Roberts Bill should pass the House, is a matter of speculation at this writing.

It would seem realistic to assume that regardless of the fate of Federal aid, some or all of the burden of financing the construction of an educational television network must necessarily fall upon the people of Hawaii. The temptation is simply to recommend that these funds be provided by the State Legislature of Hawaii.

But while it is apparent to the authors that the major portion of the construction funds must come from this source, we strongly recommend that Hawaii follow in the well-worn path of its predecessors in educational television by seeking every possible favorable arrangement for the acquisition of land, buildings and equipment through private philanthropic grants, dollar-a-year leases, donations in kind, and all the other tested methods of dispersing the initial shock of a capital investment of the size indicated here.[6]

With respect to operating funds, reference has been made earlier in this chapter to various systems of support for those educational stations now on the air. These support dollars come either from legislative appropriation (for state operated stations and networks), the budgets of parent institutions (for stations operated by colleges, universities and school systems), or from public fund raising and program production contracts (for stations operated by community corporations).

In the context of our earlier recommendations for licensing and control of the educational network in Hawaii, no one of these systems of support seems appropriate by itself; we recommend, therefore, that consideration be given to a compound of these systems that would take account of the following factors:

1. Basic operating support from the State Department of Education as principal benefactor of the educational television network. This support should be predicated upon a payment to the station for instructional television services, such payment to be on the order of

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[5] An amendment permits each state to credit for matching purposes 25% of funds already invested locally in educational television.

[6] National Educational Television is currently offering the grant of an Ampex Videotape Recorder, valued at approximately $50,000, to new educational stations which affiliate with the network as one means of stimulating the activation of stations.

$1.50 to $1.75 per enrolled student per year. (Estimated at $225,000 to $250,000).

2. Participation of the independent and parochial schools on a similar per student basis, but limited to the degree of their participation and size of their enrollment in the instructional television services. (Estimated at $25,000).
3. An annual allocation of funds from the University of Hawaii, including the East West Center, based upon the University's interest and participation in the broadcasting activities, but not predicated (for practical reasons) upon the size of student enrollments. (Estimated at $50,000).
4. Contributions, program grants, and payments for contract services from private colleges, philanthropic foundations, cultural institutions and association, and Hawaiian industry, business, and labor. (Estimated at $20,000).
5. Voluntary public subscription from viewing families based upon a renewable annual payment for the evening broadcasts of adult education, cultural and public discussion programs, and constructive children's entertainment. (Estimated on a projection of 1000 subscribers at a minimum of $10 per year per family for a total of $10,000).

In recommending a diversification of the sources of income support for the state educational network in Hawaii, the authors are aware of the difficulties they are throwing in the path of those who will be responsible for facing semi-monthly payrolls and insistent creditors.

However, the principle is well established that a sense of responsibility and obligation tends to follow an investment of dollars. By diversifying the investment, we would hope to achieve a larger sense of participation and responsibility on the part of all those who bear the weight of more fully developing Hawaii's cultural and educational life.

There are those who believe that educational television will not meet its potential without a program of local and national tax support to undergird the financial architecture of the entire movement.[7] The authors do not oppose the concept of tax supported educational television, and believe the often made analogy between educational television and tax supported public libraries is a valid one.

The decision as to the degree of tax support desirable or feasible in Hawaii can only be made by the people of Hawaii through their elected representatives in the State Legislature.

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[7] See Lyle M. Nelson, The Financing of Educational Television, referred to earlier.

We do not recommend this course of action unless, in the considered judgment of Hawaii's educational and cultural leaders, the program of diversified support recommended above is for any reason impractical or unworkable in the milieu of the state's economic and social structure.

Whatever the sources of income, the authors are united in their conviction of the soundness of the investment: in no other way can the benefits of an educational dollar be spread to the profit of so many.

VI

THE NEED: SUMMARY AND CONCLUSION

The desirability and efficacy, if not the necessity, of educational television for the State of Hawaii is implicit in both the foregoing examination of its potential and practice on a national scale, and in the authors' recommendations for its applications to the peculiar problems of education in the Fiftieth State.

The question remains, however, whether existing television facilities would not be adequate to this need, and could not serve the purposes of educational television without the additional investment in a fourth network of stations for the exclusive use of education.

The Use of Existing Facilities

Reference has been made to the three existing commercial television stations in Honolulu, each affiliated with one of the major commercial networks, and each with its own complex of satellite stations to cover the population centers of the major islands.[1]

Early in 1961 the managements of the three stations proposed through the Governor's Office that the State Department of Education make use of the existing technical facilities for the broadcast of educational television programs during the hours between midnight and early afternoon when these facilities are in less demand for commercial purposes.

The proposal cited the economies to be realized by the use of existing transmitters and technical staffs, though recognition was given to the possible need for constructing and equipping a special studio on the University campus or elsewhere, and the ultimate need for a separate educational television network.

Since the purpose of the proposal is to effect a savings, it would be well to examine the economies involved.

If existing commercial facilities were used for educational television it would obviate the expense of constructing a network of educational transmitters (estimated in this report at $570, 300) and a production center in Honolulu (estimated, with costs of a building, at $676, 900).

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[1] KGMB, Channel 9, (CBS), owned by the Honolulu Star-Bulletin; KHVH, Channel 4, (ABC), owned by the Henry J. Kaiser Co.; and KONA, Channel 2, (NBC), owned by the publishers of the Honolulu Advertiser.

These are, of course, impressive savings. But they cannot stand without examining the costs of using existing facilities.

The commercial television stations would have to recover their overhead expense by selling time to the educational interests at their "break-even" costs. No indication was given of the amount of these "break-even" costs, but experience in similar situations would suggest they are between $300 and $400 per broadcast hour.

On the assumption that commercial facilities will be used for a five hour period each day between 8:00 AM and 2:00 PM, five days a week, thirty-six school weeks a year, the total cost to education would approximate $300,000 a year.

Since the State Department of Education, and other educational agencies using the facilities, would have to employ some program production personnel to augment the thin program staffs of the commercial stations, the annual cost for 25 hours a week for the 9 months of the school year would probably exceed the operating costs of an educational network whose programming would not be limited to the school year, nor to the 25 hours a week assumed here.

If our assumptions were stretched to embrace the forty hours per week of programming that is the average of the sixty ETV stations already broadcasting, the costs begin to approach in one year the total capital outlay for a complete statewide educational television network.

But assumptions of this order are elusive and illusory, whether made by commercial or educational broadcasters. To be sure, certain economies could be effected by using existing commercial facilities, but they are neither as large as they at first appear, nor do they take into account the cost to educational television of a quality and flexibility that is at the heart of the Federal Communication Commission's action in setting aside special channels for this purpose.

It is highly unlikely, for example, that the three commercial stations could supply forty hours of program time each week, some of these at the hours most in demand for both commercial and educational purposes, and guarantee non-cancellations of these hours over a period of time.

Since theirs is a business in which they cannot afford to sell at cost what they can easily sell at a profit, they cannot be held at fault for this position. The argument does not ignore the demand that each television station provide a certain number of hours of educational programming to conform to terms of its license, but these few hours do not constitute educational television in its broadest and most meaningful sense.

Although the offer of the commercial television stations is not, in the view of the authors, an answer to the needs of Hawaii for instructional and educational television, it is an important and useful step in that direction, and has been taken into account in the recommendations which follow.

Summary of Recommendations

The recommendations embodied in this survey and report center upon a single theme: the general value of educational television in a world of exploding ideas, and the particular value to the State of Hawaii, isolated both from itself and from the mainland.

The means exist in educational television to help bridge both the educational and the geographical gap, and the means are available.

Specifically, we recommend:

1. The creation, under appropriate State statutes, of an educational television council, commission or foundation, composed of from seven to thirteen citizens broadly representative of Hawaii's educational and cultural institutions, to:
    - a. Construct and operate a television production studio in Honolulu for the production of instructional programs for schools and colleges, constructive entertainment for children, and cultural, public affairs, and adult education programs for family viewing:
    - b. Construct and operate television transmitters on those channels reserved for educational use on Oahu, Maui and Hawaii, with additional translators as necessary, to provide the widest possible television coverage for all of Hawaii's homes and schools;
    - c. Provide for the financing of such construction from legislative appropriation and private philanthropic grants, and for an annual operating income derived from a combination of school and university subsidies; industrial and foundation grants, and public subscription.
2. The affiliation of the state educational television system with the National Educational Television network of sixty stations to provide the citizens of Hawaii with the alternative program service of America's "Fourth Network."

3. The appointment of a Coordinator of Instructional Television within the State Department of Education to plan, with appropriate members of the State Office staff, programs of superior television instruction for classroom use, in-service education for teachers, and adult education programs for the family.

4. The appointment of a faculty committee on television (and, as the demand for television services increase, a full-time television coordinator) at the University of Hawaii to plan for and experiment with credit and non-credit courses for adults, home teaching for students, agricultural extension programs for farmers, etc.

5. The equipping of all public schools with television receiving sets.[2]

6. Experimentation with the use of advanced teaching aids and techniques on the proposed Hawaii-Kai closed-circuit cable system when the facilities for such experimentation are completed.

No attempt has been made to list these recommendations in any order of priority, since all but the last are elements in a single plan. In recognition of the reality that time will be required to effect the implementation of these recommendations, we suggest that several interim activities can be profitably undertaken to provide experience in the production and use of educational and instructional television programming, specifically:

1. The immediate use of commercial television facilities for in-service education of teachers, utilizing courses of instruction now available on videotape and kinescopic recordings, to be directed to teachers in their own homes;

2. At the point where a substantial number of receiving sets are installed in school classrooms, experimentation with instructional programs over commercial facilities, drawing upon the library of recorded programs available from other educational television stations;

3. At the point where adequate professional production assistance is available to the State Department of Education and to the University, experimentation with locally produced instructional programs for classrooms and adults.

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[2] In this respect the recommendation of the House of Representatives of the Hawaiian Legislature, incorporated in the State Finance Bill, that the fifteen receiving sets now in the State Department of Education be transferred to other public institutions is a definite step backward.

Our final recommendation may seem premature in view of all that must precede it, but experience on the mainland proves conclusively that early thought must be given to the matter of securing adequate television channels for the needs of education.

The channels currently reserved for education's use in the State of Hawaii will serve the immediate needs outlined in our recommendations, but these needs will quickly outdistance the available channels which the Federal Communications Commission has set aside.

Three educational television stations on the mainland have applied for, or are operating, second channels in their cities. Multiple channels make possible the simultaneous broadcast of two or more instructional programs in different subjects or at separate grade levels.

It is inevitable that the same need will arise soon in the State of Hawaii; therefore, we recommend attention to the problem of securing additional channel assignments for educational use in the ultra high frequency band.

Channels are available in the UHF band now only because they are in little demand by commercial broadcasters; technological and political developments in the next several years are likely to create a sudden demand for the remaining channels.

If the educators hope to meet their own needs, it would be wise to act before these channels become scarce.

Conclusion

The plantation worker on the island of Lanai and the small farmer in Tennessee have little in common save for the important fact that both are sovereign citizens of the United States.

But, whereas, the farmer in Tennessee has the opportunity of visiting other parts of his own country, the plantation worker on Lanai may live out his life without leaving his own little island.

More importantly, the Tennessee farmer has available -- as near to him as his television receiver -- the fruits of his own culture. He can learn to read and write, finish a high school education, receive instruction in the latest agricultural methods, or, if his tastes suit, enjoy performances of the Boston Symphony Orchestra and the world's great classic plays.

His children can attend schools where the nation's greatest teachers join hands with the classroom teacher to motivate and instruct young minds in the latest developments in science and mathematics, foreign language instruction, appreciation of the literary heritage of the Western world, and an awareness of the meaning of world events.

The means are available to give the plantation worker on Lanai these same advantages. What has been done in Memphis -- or Urbana, or Sacramento, or Albuquerque -- can be done in Honolulu if the will exists to see it done.

The cost in dollars is not insignificant; the cost in terms of the numbers of people served is.

The question of whether or not Hawaii can afford educational television must be answered with another question: Given the geographical isolation of the islands of the State, the accelerated demands for more and better learning by children and adults alike, and the technological means to surmount this isolation with the wisdom of the nation's finest minds, can Hawaii afford not to have educational television?

APPENDIX A

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APPENDIX B

Channels Reserved for Educational Use in Hawaii

Honolulu, Oahu	Channel 11
Hilo, Hawaii	Channel 4
Lihue, Kauai	Channel 8
Wailuku, Maui	Channel 10

Regulations Governing Educational Stations

The following is excerpted from Volume III, Part 3 (Radio Broadcast Services) of the Rules and Regulations of the Federal Communications Commission.

Paragraph 3.621 Noncommercial Educational Stations

In addition to the other provisions of this subpart, the following shall be applicable to noncommercial educational broadcast stations:

(a) Except as provided in paragraph (b) of this section, noncommercial educational broadcast stations will be licensed only to nonprofit educational organizations upon a showing that the proposed stations will be used primarily to serve the educational needs of the community: for the advancement of educational programs: and to furnish a nonprofit and noncommercial television broadcast service.

(1) In determining the eligibility of publicly supported educational organizations, the accreditation of their respective state departments of education shall be taken into consideration.

(2) In determining the eligibility of privately controlled educational organizations, the accreditation of state departments of education or recognized regional and national educational accrediting organizations shall be taken into consideration.

(b) Where a municipality or other political subdivision has no independently constituted educational organization such as, for example, a board of education having autonomy with respect to carrying out the municipality's educational program, such municipality shall be eligible for a noncommercial educational television broadcast station. In such circumstances, a full and detailed showing must be made that a grant of the application will be consistent with the intent and purpose of the Commission's Rules relating to such stations.

(c) Noncommercial educational television broadcast stations may transmit educational, cultural and entertainment programs, with programs designed for use by schools and school systems in connection with regular school courses, as well as routine and administrative material pertaining thereto.

(d) An educational station may not broadcast programs for which a consideration is received, except programs produced by or at the expense of or furnished by others than the licensee for which no other consideration than the furnishing of the program is received by the licensee. The payment of line charges by another station or network shall not be considered as being prohibited by this paragraph.

(e) To the extent applicable to programs broadcast by a noncommercial educational station produced by or at the expense of or furnished by others than the licensee of said station, the provisions of paragraph 3,654 relating to announcements regarding sponsored programs shall be applicable, except that no announcements (visual or aural) promoting the sale of a product or service shall be transmitted in connection with any program: Provided, however, that where a sponsor's name or product appears on the visual image during the course of a simultaneous or rebroadcast program either on the backdrop or in similar form, the portions of the program showing such information need not be deleted.

APPENDIX C

EFFECTIVENESS OF TELEVISION TEACHING*

"The following table sums up the result of the 393 comparisons in schools and colleges. '+TV' means that television was significantly superior (at the .05 level or better) to ordinary classroom teaching; 'n. s.' means not significant -- no difference between television and face-to-face teaching at the .05 level; and '-TV' means that television was significantly inferior to ordinary classroom teaching at the .05 level or better.

Thus the first box of the table should be read: In experiments on teaching mathematics in the 3rd through 6th grades, television was significantly more effective in 14 cases, there was no significant difference in 21 cases, and in 3 cases television was significantly less effective than was ordinary classroom teaching.

SCHOOL LEVEL		MATH.	SCIENCE	SOCIAL STUDIES	HUMANITIES HISTORY LIT., ARTS	LANGUAGE SKILLS	HEALTH, SAFETY	TOTAL	
3rd-6th Grades	+TV	14	8	12	0	14	2	50	+TV
	n. s.	21	14	11	0	36	4	86	n. s.
	- TV	3	1	1	0	10	1	16	- TV
7th-9th Grades	+TV	4	9	0	2	0	3	18	+TV
	n. s.	11	8	1	7	0	1	28	n. s.
	- TV	2	3	0	0	0	0	5	- TV
10th-12th Grades	+TV	0	3	3	4	1	1	12	+TV
	n. s.	10	7	17	17	6	0	57	n. s.
	- TV	5	3	0	9	4	0	21	- TV
College	+TV	0	1	1	0	0	1	3	+TV
	n. s.	4	26	24	11	12	7	84	n. s.
	- TV	0	1	4	3	1	4	13	- TV
TOTAL	+TV	18	21	16	6	15	7	83	+TV
	n. s.	46	55	53	35	54	12	255	n. s.
	- TV	10	8	5	12	15	5	55	- TV

TOTAL - 393

3rd-6th grades different from 10th-12th, p. = .001. 7th-9th different from 10th-12th, .01. 3rd-9th different from 10th-college, .001. Both 3rd-6th and 7th-9th different from college, .001. Science different from humanities, .01. Social studies different from humanities, .05."

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* From Schramm, Wilbur, "What We Know About Learning From Instructional Television," Institute for Communication Research, Stanford University.

APPENDIX D

NATIONAL EDUCATIONAL TELEVISION

National Educational Television (NET) is American's only truly "alternative" program service, providing each of its affiliated educational stations with ten hours each week of film and videotape programs drawn from the resources of its own stations, foreign film and television systems, and special contract productions. These are a few of the programs to be seen during 1961-62 on NET educational television stations.

WHAT'S NEW	A daily children's program, informative and entertaining, embodying segments on science and nature, art, sports, storytelling and the world around us.
AGE OF KINGS	The much acclaimed television presentation of eight Shakespeare plays, recreating eighty-six years of turbulent and fascinating British history, with introduction by Shakespearean scholar Dr. Frank Baxter.
BOSTON SYMPHONY	Six full length concerts with this distinguished orchestra plus one full-length concert by the famous Boston Pops.
NET DRAMA FESTIVAL	Performances of the world's greatest drama, including plays by Moliere, Ibsen, Wilde, Shakespeare, and Gorky.
PROSPECTS OF MANKIND	A series of symposiums moderated by Mrs. Eleanor Roosevelt and featuring such guests as John F. Kennedy, the Honorable Hugh Gaitskell of England, and V. K. Krishna Menon of India.
HERITAGE	An award-winning series of informal and lengthy close-ups of some of the nation's most eminent personalities, including Edward Steichen, Richard Rogers, and Walter Piston.
PHOTOGRAPHY: THE INCISIVE ART	Photographer Ansel Adams discusses photography as an art form against a background of his and other distinguished photographers' works.

Appendix D - continued

AMERICAN MEMOIRS	A nostalgic look at America since the turn of the century, her books and autos, films and philosophies, featuring John Dodds of Stanford University.
MIRROR OF MAN	Actor Vincent Price on a tour through the wondrous world of modern American art.
RAGTIME ERA	The music -- and the foibles -- of the age of ragtime in American history, narrated and performed by Max Morath.